COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper – Second-class postage paid at Chicago, Illinois

Vol. IV No. 40 | October 7, 1970 | Price: $9/year

Primary Highlighted by 'Discrepancies, Irregularities'

By Thomas J. Morton
CW Midwest Bureau

DETROIT – Take a computerized voting system, call some borrowed DP centers "counting centers," send them test decks that don't work, staff them with outside supervisors and observers who aren't too sure of what a computer is, provide inadequately documented backup procedures, throw in a program patch or two, and shake well without a shakedown.

That's the summary of the Detroit primary held in August.

It wasn't until Aug. 29 – 25 full days and nights after the primary – that the [board of] canvassers certified the primary vote count, with explanations and a mysterious extra 1,111 votes [CW, Aug. 12].

But the certification was done with reservations, according to Emmet E. Tracy Jr., an attorney, and a Republican member of the board. "We had a reasonable case for not certifying because of various discrepancies and irregularities," he said.

It took two days to count the votes, and Detroit ended up with 1,111 votes too many. An official explanation of the "computer error" was that a card reproducer made an extra hole in one card in a test deck [CW, Sept. 16].

DP Discrepancies

The discrepancies surrounding the data processing procedures of the counting seemed to be a good beginning for the confusion.

To start with, the man in charge of the computer operation at one counting center, according to a member

(Continued on Page 6)

Violence by Rebels Threatens Centers

By Thomas J. Morton
CW Midwest Bureau

CHICAGO – Violence, demolition, fire or sabotage may well be the next security problem to be faced, and met, by the DP manager and his people at the university computer center, at the information nets of police and court officials, at governmental agencies, as well as at the industrial and commercial DP centers.

"In the last 15 months," said Neil J. Welch, special agent in charge of the Detroit Office of the Federal Bureau of Investigation, "4,330 bombings have occurred in the U.S. Forty people have been killed and another 380 injured."

Welch was speaking to police officers of metropolitan Detroit at an FBI-conducted bomb seminar. "Damages," he said, "have been estimated at $25 million."

The FBI agent listed the possible would-be bombers among the "New Left, the Black Panther Party, the White Panther Party, and the Weathermen, a faction of Students for a Democratic Society (SDS).

Things to Come

After a meeting of the SDS in Flint, Mich., last December, Mark Rudd, leader of the 1968 revolt against Columbia University in New York, told reporters: "The 1970s will see violence that will make the 1960s look like a Sunday school picnic."

An underground newspaper, sold openly on the streets of Chicago, named the *Seed*, had an article recently encouraging what the paper said were acts "furthering the war against the imperialism of the establishment pigs."

The article gave elaborate and explicit instructions on the sabotaging of police and business data processing centers.

At what was termed "a convocation of American youth" held recently in Milwaukee, a young girl, an SDS member who dubbed herself "Delilah," told her listeners at a rally that computers were to modern man what the Spanish Inquisitors were to "those of yesterday who sought only to escape the tyranny of a cruel religion."

She said that computers were just "malicious gossipers tattling

(Continued on Page 4)

Plug-to-Plug Combustible

Building manager at Smithsonian Institution examines destroyed CRT terminal which fueled last Wednesday's inferno at the Washington museum, closing the third-floor display area for an indefinite period. A Smithsonian official originally assigned the cause to an "electrical malfunction" in the IBM 2260 terminal, which was used in an IBM exhibit valued at $50,000. IBM stated that there were "two or three redundant systems" in the 2260 designed to prevent an internally caused fire, and they were checking on any history of such occurrences. The terminal was used by youngsters to play tic-tac-toe and for other exercises, and was not part of the historic computer exhibit located elsewhere in the museum. Cause and cost of damage must be reported to Congress.

Recycling DP Cards and Printouts Helps Ecology - and Petty Cash

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – Users are combining concern for ecology with that old carrot before the horse, the profit motive, by capitalizing upon the fact that used punched cards and printout are very much in demand by salvage companies for recycling.

One salvage company alone, with five operating bases in the U.S. and Canada, handles 700 tons of punched cards a month. With an average of five pine trees required to make one ton of cards this means a savings of 3,500 treees every month or 42,000 trees a year.

Art Kazarian, president of B.J. Services, a salvage company, pointed out that both punched cards and computer printout paper are made from high grade, long-fibered pulp and can be recycled into toilet paper, towels and even back to printed forms.

As far as quantity goes, he said punched cards are the prime commodity.

Large salvage contractors and paper jobbers pay about $60/ton for noncolored punched cards. Colored cards bring about half that price because they have to be de-inked in the recycling process. Printout paper brings between $20/ton and $30/ton. At these prices, each punched card

(Continued on Page 4)

Computers at War

Action Tests Prove Applications' Value

By Bernice Pantell
Special to Computerworld

SAIGON – In reviewing the use of computers by the military services at war in Vietnam, the most significant lesson one learns is that computer applications designed during peacetime stand up under rigorous test during wartime. This is no coincidence.

The criteria for military programs always include wartime operating conditions. But it is interesting to find out how well the concept works.

Widespread use of computers by the military services developed only during the past 12 years. Their use in Vietnam, then, is the first test of their wartime applicability.

In spite of notable exceptions, one cannot fail to be impressed with how well computers behave on the firing line, at sea, and in support of air operations.

Tailored vs. Packaged

Another really important lesson pits tailored against packaged programs. The packaged programs win, hands down. There is not a single instance of an independently programmed application in Vietnam equaling the performance of a

(Continued on Page 4)

On the Inside

Computer Plays Role In Welfare Defrauding – *Page 2*

User Says Facilities of AT&T 'Marginal' – *Page 17*

Communications 17
Computer Industry 31
Editorial 8
Education 20
Financial 35
Societies 22
Software/Services 13
Systems/Peripherals ...15

Computer Plays Big Role in Defrauding Welfare Unit

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – Los Angeles County has uncovered a "swindle" operation in the Data Processing Department of Public Social Services (Welfare) (DPSS) that so far has been estimated at more than $50,000.

Indicted by the grand jury on Sept. 24 were 11 persons, three of them employees of DPSS and one a former employee.

The employees screened changes of payee and pay amount information that is supplied to the computer. The computer system was exploited in the alleged conspiracy to send checks to the employees themselves and to friends and relatives.

The method used was to take assigned state welfare numbers for cases that they knew were about to be terminated, and retaining the number which the computer would recognize and act upon, they changed the name of the payee and upped amounts under pretext of retroactive payments, special payments, etc.

Checks ranging from $500 to $715 were sent to them.

The scheme was uncovered only because in one case the welfare claimee had put in a change of address to San Francisco.

The Welfare Department continues payments for two months in the event of a change of address out of the county. The alleged conspirators changed the name of the payee and the address but neglected to change the city. The check was eventually returned by the post office as "no such address" and it was discovered that the check was made out to an employee of the department.

An audit is being done of all the records by DPSS and the district attorney's office to determine any further extent of fraud.

Charles Ventura, head of the data processing operation, said that the system had been devised on the assumption that people are honest. They are now trying to devise a method to move out of the present screening and verification system and raise the review authority to another level.

Off-Track Betting Plan Depends on DP

NEW YORK – Organized crime is the intended loser in New York's computerized off-track betting program due to begin near the end of this year or beginning of 1971.

Computer Sciences Corp. (CSC) Vice-President Dr. Alvin E. Nashman stated that each transaction would have a unique, many-character code number, partly random and partly determined by the "name of the bet." These numbers will not be sequential, Nashman said, and part of the standard procedure before paying a winning ticket will be a check of the code.

Nashman noted that any counterfeiting would thus be detected when the second attempt was made to cash a duplicated ticket.

Since, as Nashman claimed, it is "impossible" to predetermine the correct code number of the winning bet, it would take a specific counterfeiting attempt to produce a duplicate.

Digital Equipment Corp. PDP-8 computers are used as terminals, with an IBM 360/50 the central processor.

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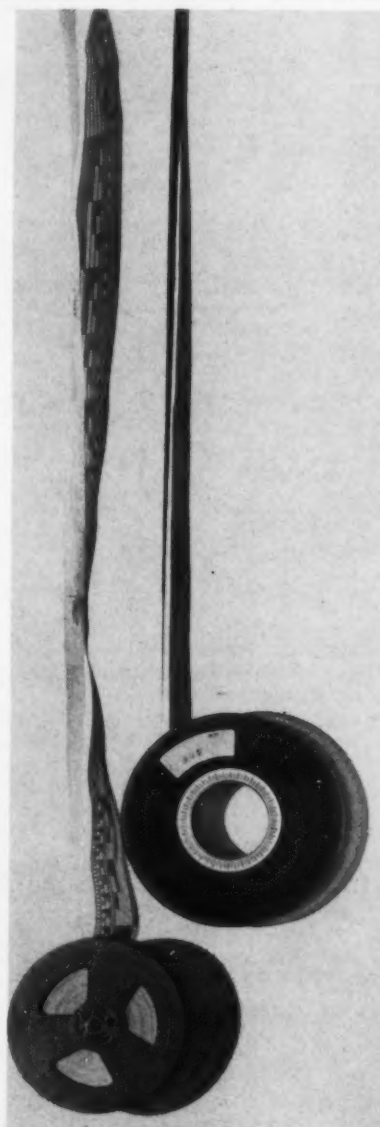
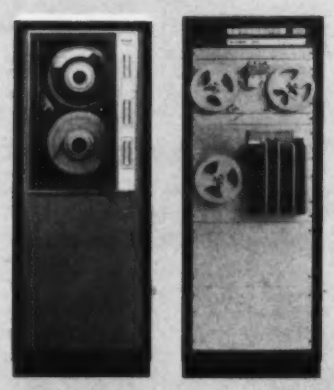


Computer compatibility, a hang-up we understand



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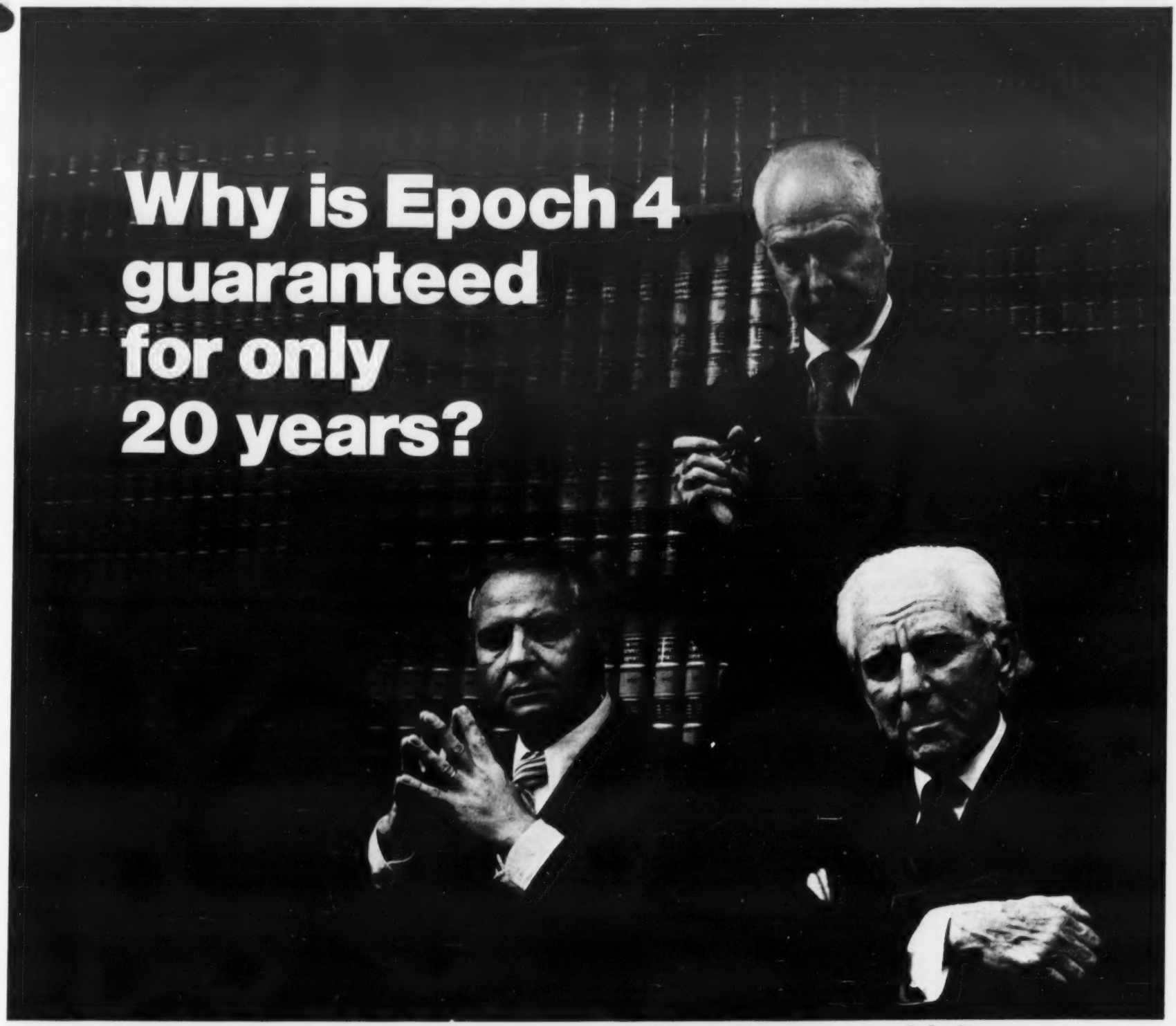

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Contracts Useless Without System Software Clause?

By Edward J. Bride
CW Staff Writer

BOSTON – Most computer contracts are worthless as legal tools.

Since most contracts do not discuss "system software," the manufacturer's step of certifying equipment "ready to use" is meaningless.

Most contracts treat application packages as separate items, or addenda, according to Roy N. Freed, a lawyer who has addressed management seminars and written articles on computer contract protection for users.

Freed stated that few manufacturers, if any, cite system software in the basic contract. Such software under development or supposedly perfected is not discussed at all, which means that the vendor assumes responsibility for the *hardware only* when he certifies the system as "ready to use."

Freed said that prospective users are unwilling to take the time to sit down and think what risks are involved in signing a computer contract.

Therefore, he stated, these clients don't know "what costs they should incur in undertaking protection."

Freed told CW that "agreements refer to equipment only," and do not protect users by issuing warranties for operating programs, despite the fact that "the machine is dead" without them.

He also charged that manufacturers ignore the possibility that users could be subject to infringement charges on certain operating programs.

As an example of what can happen when all obligations are not dealt with in a contract, Freed cited a lawsuit currently in litigation which charges several inadequacies of a manufacturer.

A Univac customer charged the company with inferior programming, nonfulfillment of promises of training and services and, in effect, ineffective consulting.

Univac categorically denied all charges, except that it is a bundled computer maker holding contracts with various customers. The company thus denied essentially all responsibility in this $271,000 damage suit by United Engines, Inc., of Shreveport, La.

A central issue in this "your-word-against-mine" case is whether the Univac sales personnel advised United that parallel runs were needed when converting from manual bookkeeping.

United admits it removed a manual system "in anticipation" of a "promised" delivery date for its Univac 9200, Oct. 1, 1967.

The manufacturer countered that the problems were "not the fault of Univac but [were caused] entirely by the acts and omissions of United."

'We Warned You . . ."

These omissions allegedly included failure of the user to heed Univac's warning of the need for parallel operation, "during which adequate controls and the continuation of manual accounting systems are essential if errors are to be avoided entirely."

Although Univac is bundled, and says it intends to stay that way, it stated that one of United's "failures" was the failure "to cause the EDP equipment to be adequately programmed."

United charged that Univac never informed the company that the conversion could not be accomplished before Oct. 1. According to the suit, the equipment was not received until Dec. 5, two months after the manual accounting was discontinued.

Many of the charges and counter-charges have been treated in other lawsuits. This one, however, also specifically charges Univac with not carrying out one basic requirement of the contract: certifying the equipment "ready for use . . . in writing to the customer."

In fact, it never was ready for use, the suit charged, because both the hardware and the software were inadequate.

Sworn statements are still being taken in the suit, which was filed in January 1969.

Not Clearly Defined

The lawyer stated that "even today, companies do not identify" certain software and services that customers might expect when they sign a contract, whether the expectation is justified or not.

He stated he had examined the contracts of IBM, RCA, Honeywell and Control Data, and found this to be the case in all four agreements.

United Engines, meanwhile, has returned its Univac 9200, and has installed an IBM 360/20. The bookkeeping "chaos and catastrophe" during the five-month tenure of the never-operating 9200 is the issue in the damage claim.

Computer Applications in Vietnam Prove Their Value

(Continued from Page 1)

packaged application, wherever conditions are comparable.

But there is evidence, under comparable circumstances, that centralized programming excels over tailored efforts. The Marine Corps supply system, at the Fleet Logistics Center in Da Nang, is a model of efficiency and power. The programs were all written at a centralized automated service center.

In comparison, the least effective supply system in Vietnam is in operation at Long Binh, where the Army has modified a centrally developed system and produced a monster that boasts a 77-hour "daily" cycle. They both are doing the same job.

Another example is the Navy intelligence function on the ships on Yankee Station against the intelligence activity of the Air Force at Tan Son Nhut Air Force Base in Saigon.

The Navy runs programs directly out of a central Fleet Computer Programming Center. The Air Force writes most of its own programs here.

The Navy intelligence application is real-time and has replaced horrendous amounts of manual effort.

The Air Force application comes up with results within 24 hours, as they like to emphasize, apparently because it represents some sort of improvement to them. But compared to Navy applications, it is back in the "horse and buggy" days.

Aiming High

Perhaps centralized programming activities aim high to avoid premature obsolescence and then apply good, professional programming concepts to their work, without undue interference.

And perhaps in-house programming shops suffer the familiar problem of trying to satisfy customers of varying degrees of ignorance, but holding proportionate degrees of influence.

It is a familiar story to those in the computer business, and the best of them can fail because of it. It may be that this problem is substantially absent in centralized programming agencies. It is worthy of study by any widespread, dispersed organization, governmental or private.

One final observation: the cooperation among normally competitive manufacturers and software houses, many of whom are working side by side here in Vietnam, is unique.

Military and civilian, profit and non-profit, competitive and non-competitive companies all are working together in the same installations to get the job done.

No doubt this type of cooperation is inappropriate under normal conditions. But here, where it is both appropriate and essential, it is rather like a trademark of the industry.

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Second-class postage paid at Chicago, Ill. Published weekly (except a single combined issue for the last week in December and first week in January) by Computerworld, Inc., 25 E. Chestnut St., Chicago, Ill. 60611. © 1970 by Computerworld, Inc.

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Recycling of DP Paper Provides Ecological Benefits for Everyone

(Continued from Page 1)

is worth $.0001875. There are about 320,000 cards in a ton.

Garbage Prices

Wells Fargo Bank, based in San Francisco, looked into recycling when its garbageman raised his prices. As its paper is always inspected every night to make sure that no legal documents or securities are accidentally thrown out, the salvage move of sorting the paper did not require extra handling.

Punched cards have always been kept separate. While Wells Fargo is not making money on the sale of its paper, it is saving money on garbage services since there is less to be carted away.

Paper brokers generally acknowledge that trash men have realized the bonanza gained through recycling of cards, and automatically sort them out of their trash.

The Bank of America, also a salvager of paper, has eight tons of punched cards a month picked up from its data processing headquarters. The salvage companies, however, do not deal with just large customers. B.J. Services will pick up amounts as low as 500 pounds. Most companies preparing their trash for salvage use decorated fiber or colored bins so that at the source it is separated into colored or white containers.

IBM Practice

IBM reported that it has been recycling punched cards and other paper products in its card plants since the 1930s.

Today the company's card plants sell 8,000 tons (or 40,000 pine trees) a year to dealers who repulp the materials.

IBM also pointed out that many of the IBM punched card users began recycling scrap stocks during World War II paper drives and through the years have continued to dispose of scrap to dealers.

The official IBM position is that recycling used paper products is good business and it is looking into still other ways of disposing of the paper.

Leaky Center May Lose Vendor Support

By Edward J. Bride
CW Staff Writer

JACKSONVILLE, Fla. – The world's largest city stands to lose the services of its computer vendor if the data processing center isn't moved to larger quarters.

That's the city's interpretation of recent communications between Burroughs and the city of Jacksonville, which claims the "largest" title city as a result of the consolidation of an entire county two years ago.

The city uses four B300s and a B3500 in a DP center whose roof leaks so badly that a tarpolin is used to protect disk files, according to Burroughs.

A scathing auditor's report last summer pointed up several problems, including inadequacy of space and insecurity of files [CW, Aug. 26]. Since that time, the mayor has appointed a committee of several volunteer computer users, including IBM and Burroughs, to study and make recommendations.

A city spokesman agreed that "our major concerns here are space and personnel." The spokesman stated: "Our machinery is so piled up" that Burroughs has threatened to "quit servicing us" if something isn't done soon.

Burroughs said a letter to the city's data processing chief was not intended as a threat, but was a statement of fact that the company could not provide "the services needed under the serious environmental problems" of the center.

The finance committee promised to "entertain anything we bring up" regarding larger quarters, a city spokesman indicated, and the mayor's ad hoc committee is expected to report this week.

Winter Could Be Violent

(Continued from Page 1)

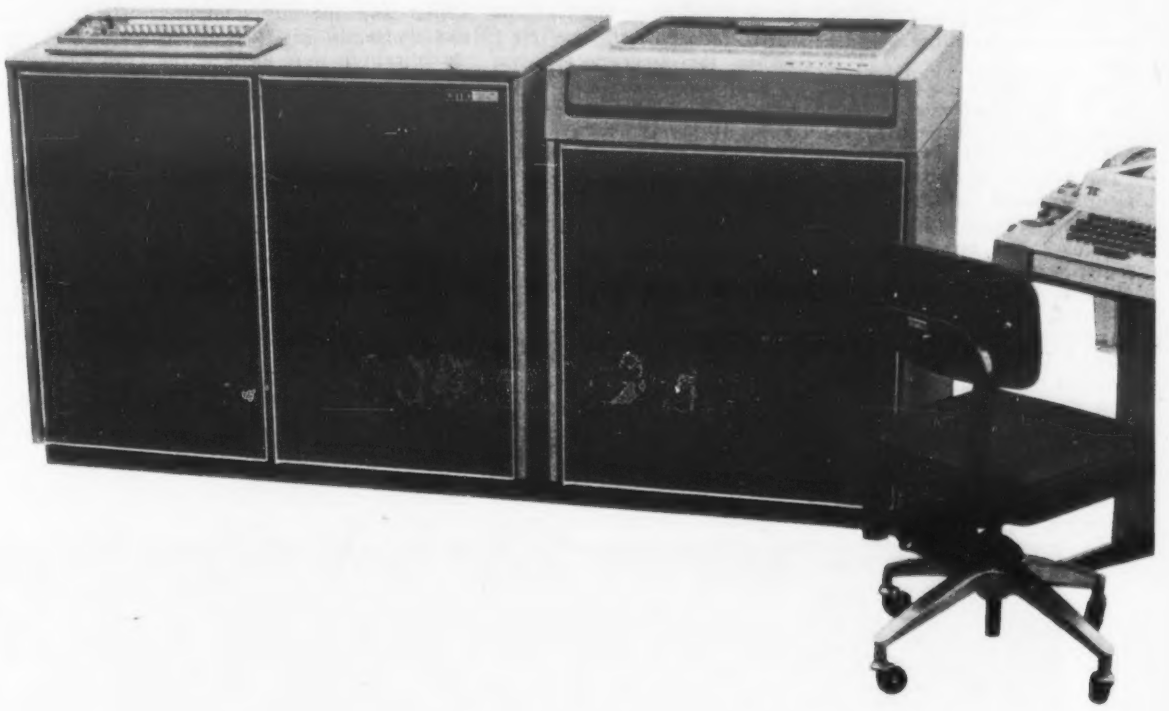
untruths to eager ears."

'Pinioned Free Men'

Delilah advocated the sabotaging of data centers since they "pinioned free men to the display board of a sick and greedy society."

She said that data processing sites that housed records such as those maintained by law enforcement agencies, banks, credit bureaus, and welfare agencies "destroyed" men by their "promulgation of lies, unfounded presumptions, and outright deceits perpetrated in the cause of capitalistic propaganda."

She urged her listeners to "stop" or "deter" the "warmongering of America by destroying the imperialists' electronic intelligence."



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Detroit Vote Counting Nurtures Some Confusing 'Facts'

(Continued from Page 1)

of the accuracy board assigned to that particular center, "didn't know a computer from a grapefruit.

"He did not know anything about the program, programming, or the (computer) system."

The program, according to the security board member, called for two disk packs, but only one disk pack was brought to the center to which he was assigned.

"All programs, tables, and the operating system were supposed to be in the disk pack [as a work pack]," he said, "so that all an operator had to do was hit the start button and follow the directions printing out to him on the console typewriter under program control.

"There were no written procedures or program listings for the operator to refer to. He was to fly blindfolded, in effect," he added.

When the accuracy test was started, the board member explained, the test had to be halted within 10 minutes since the console kept printing out that the cards were out of sequence.

The supervisor, the man without computer knowledge, telephoned the city-county building for instructions. He was told, the board member said, to wait for a new disk pack.

"The real sore spot with me," the board member told CW "was that once the new disk was operating, we got past the tables, but then the printout kept asking for a dataset and no one knew what to do."

He said that a running telephone conversation was maintained between that counting center and the city computer center. He also said that several modifications were made in the program during the test count in order to continue with the test.

Rule Violation

"Modifying that program," he said, "was in direct violation of the rules set up by the elections commission. It is, in effect, an illegal act," he added.

Operators from the various centers seemed to feel that wrong programs were sent to various centers. Even though the computers at the centers were similar, they were not identical. The computer program employed at the American Motors' center seemed, the operators indicated, to be searching for the computer configurations of another center.

In the aftermath of the snafu, the Senate of the state of Michigan has ordered a legislative investigation into the Detroit election. The Detroit board of canvassers, that body responsible for certifying the results of the election, raised the following questions in its investigations:

- Were the ballot transfer cases locked?
- How many ballot cards from each precinct were rejected by the computers?
- How many cards were rejected because voters voted in both Republican and Democratic primaries?
- How many polling places were late in opening and why?
- Were the computer operators bipartisan?
- Were absentee ballots put on computer cards and by whom?

There were some legal discrepancies – officials running for office in that particular primary being seen in the counting centers; bags full of tab cards being brought to the centers instead of in locked, steel cases; counting centers with the police guards removed, and a ballot box sitting in a police station at 5 p.m. on Aug. 5, 19 hours after the polls had closed and the counting was to have begun.

Ladd Neuman, a columnist for the Detroit Free Press, said: "As investigators look at the election, they should nail Edwards [the city clerk who instituted the system] and Datamedia [the vendor] for anything improper they've done, but they should also investigate official indifference by others, the inadequate supervision of the election commission, the local precinct officials who did not attend instructional meetings on how to run the new system, and Mayor Gribbs for failing to cooperate and give adequate time on the city's computer for testing."

Detroit plans a punched-card election Nov. 3. It should prove to be an interesting data processing experience.

Eureka! I Have Found the 21st Perfect Number

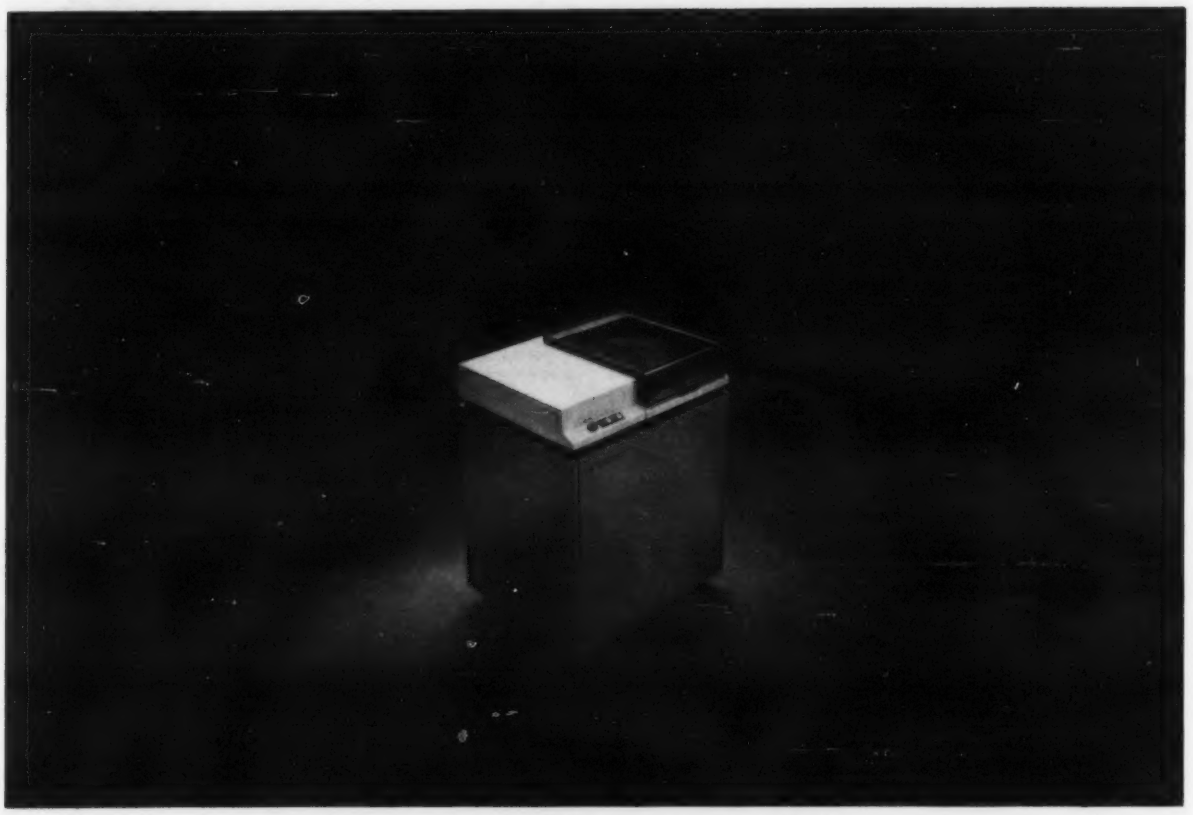
PALO ALTO, Calif. – Roy Ferguson, 18, of Dallas, Texas, found perfection at a computer terminal – and in doing so earned himself a fistful of national and international science prizes.

Ferguson, a talented mathematician, used a grant of computer power provided by Tymshare, Inc., through its Dallas office to track down the identity of the 21st perfect number.

Perfect numbers are a special breed. They are those numbers whose divisors add up to the number itself. Six is a perfect number. Its divisors – 3, 2, and 1 – total six. Twenty-eight is another perfect number – its divisors, 1, 2, 4, 7 and 14 adding to that number.

Twenty numbers have been identified in times past, but the 21st was elusive because of its anticipated great length. As it turned out, perfect number 21 consists of almost 6,000 digits. Its precise determination required large amounts of computer processing time and of course development of an appropriate computer program.

Ferguson created a relatively short but effective program in Tymshare's Fortran Language.



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When IBM set out to design System/370, we wanted it to have higher performance.

So it was designed with speed inside. (For example, Model 155's internal speed is 3½ to 4 times faster than System/360 Model 50's.)

But to keep up with the performance inside, we had to do the same thing with the system's peripheral equipment.

Like the new 3211 printer.

The 3211 is the most powerful we've ever made.

It actually prints numbers and letters at the incredible rate of 2000 lines a minute.

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It's also easy to use the 3211. There are no carriage tapes to change between jobs. A special buffer controls forms skipping. A powered stacker automatically adjusts as the paper stack gets higher. (The 3211 printer will also work with most models of System/360.)

But the new 3211 high-speed printer is only one of the ways System/370 gives you more computing.

There is a new high-speed disk file that can hold up to 800 million bytes of data.

That's three and a half times more information than any file we've ever made.

System/370 has a dramatic range of core sizes to fit your requirements.

It has more channels (Model 165, for example, has 12). So you can get information in and out of the central processing unit that much faster.

It has all this. And more.

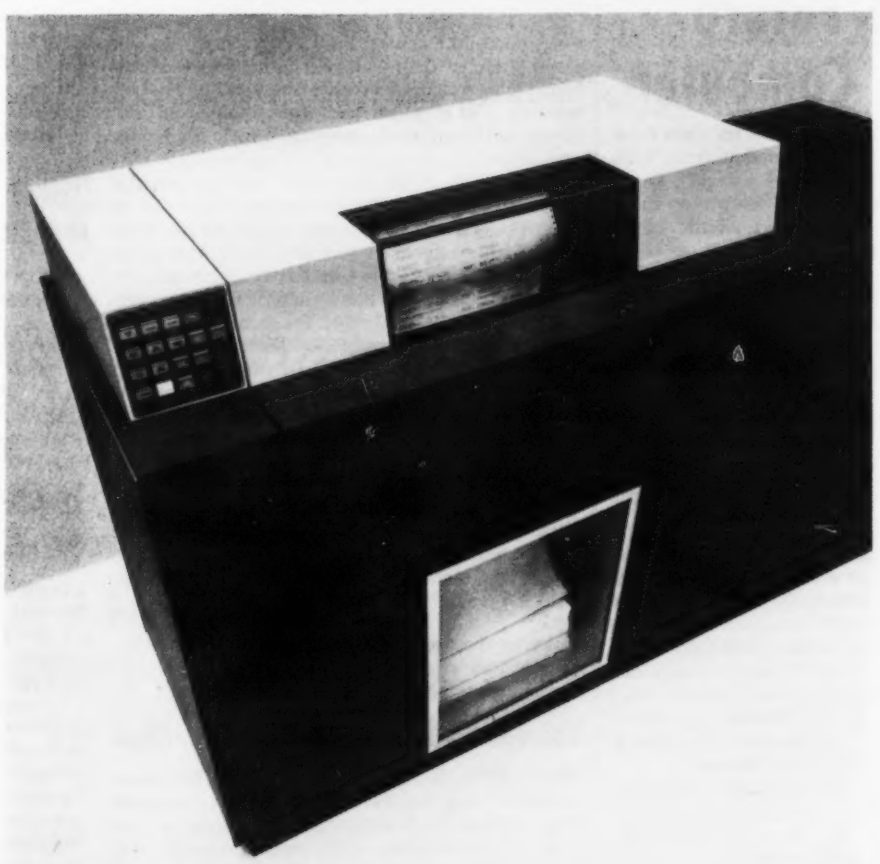
And System/370 is compatible with System/360.

You wouldn't want it any other way.

The 370.

IBM

Its new printer fires out 2000 lines a minute.



The 3211 Printer

IBM System/370. The performance computers for the seventies.

Editorials

No One Knows the Risks

One of the first steps in designing a security system is to find out what risks the DP center actually faces. Too little security would be foolish – but too much could be unreasonably costly.

It may seem incredible, but apparently there is no way to find out whether a particular DP center should be considered high-risk or low-risk.

Recent independent inquiries by CW and by a university disclosed that there is no central source of information on vandalism to computer systems.

Overall statistics, which would be of inestimable help in determining risks, are not collected by the Federal Government, by the insurance companies, or by computer manufacturers.

This means that while you might conclude from recently publicized incidents that campus computer centers fall into the highest risk category, there is no way to know. After all, other incidents have included a bombing at a stock exchange and an attack on a chemical company DP center.

Since no one else seems interested in collecting this vital information, it's up to the people most affected, the computer users, to initiate the collection. Perhaps one of the societies or one of the larger user groups could act as a clearinghouse.

CW would welcome suggestions on how this information could be gathered and collated.

'And Just When I Was Beginning to Feel at Home With the Old One'

D.C. Data-Line

FTC Sees Bright Future For Its Solitary Computer

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – When an American thinks of a Federal Government agency it is usually in terms of bigness – many people, a large operating budget and a host of computers in its working inventory. After all, the latest agency inventory shows 5,277 computers in use in the government.

The Federal Trade Commission (FTC), though, belies the typical. It has about 1,200 employees operating within an approximate $20 million budget – and it has one computer, a second generation Burroughs B283.

According to Edward Heiden, an economist in the FTC's Office of Policy Planning and Evaluation, the present system is "simply not equipped to handle the sophisticated work" the FTC hopes to do.

"We have been looking into changes that should be made," Heiden said, "but in the meantime we have time-sharing arrangements with the General Services Administration and the Department of Agriculture. Kind of a catch-on-as-you-can arrangement."

The commission is investigating the use of computer techniques to help identify companies, industries and areas of the economy where the practice of reciprocity – the mutual use of purchasing and selling power – would be most harmful to competition.

"We are using reports issued by the Department of Commerce and the Bureau of the Census to help us with our data base. This information is punched into cards and fed into our computer," Heiden explained.

"With this data base we hope in the future to be able to have the computer tell us potential reciprocity points between large companies.

"We want the computer to give us an investigative lead into what areas of reciprocity may be suspect. We don't want to have to go on a fishing expedition any more to make this determination."

Right now, he said, the FTC's approach to its use of the computer as a useful tool is really in the formative stage, and he does not see the commission's utilization of census and commerce data as an invasion of privacy. "These reports are already available to the public. All we're doing is taking them and putting them into the computer."

The FTC has, until now, relied heavily on manual, in-house data gathering techniques – which include getting information from reading newspapers and industry magazines and follow-up on letters of complaint from individuals, corporations and congressmen.

Harry A. Garfield II, assistant director of the Bureau of Competition, said that the commission is "very interested in using computer techniques in processing complaints we get on everything from citizens who claim that they have been swindled by a TV repairman to those who feel they've been done in by a computer school."

Letters to the Editor

California EDP Department Has Coordinated Planning

With reference to the article on a centralized EDP department for the State of California [CW, Aug. 26], I would like to clarify two points.

First, there are 47 *computers*, not 48 "autonomous computer centers" in the Executive Branch of the State of California, excluding higher education. These 47 computers are operated by 21 state agencies with 16 agencies functioning as EDP service centers, providing service to 25 other state agencies.

Secondly, the state does have coordinated and long-range planning. A short-range EDP master plan was adopted in January 1969, and a long-range EDP master plan was adopted in May 1970 by the State EDP Policy Committee.

These plans, prepared by the Office of Management Services, provide for the centralization of coordination and control of EDP and consolidation on a functional basis of EDP operations.

The position of the administration in opposing Senate Bill 724 was based not so much on a disagreement with the concept of the Department of Data Processing Operations as on opposition to the manner and timing of its establishment.

Should the master plan as adopted not prove to work, reconsideration of the concept of a centralized Department of EDP Operations would occur.

Charles P. Smith
Director

Office of Management Services
State of California
Sacramento, Calif.

Voicepac-2000 Price Includes Mini

In regard to the voice response comparison chart published Aug. 26, Periphonics is very concerned about having its Voicepac-2000 depicted as the most expensive device in the chart. In reality, it is the least expensive [based on capability].

Donald B. Kaiserman
Vice-President, Marketing

Periphonics Corp.
Rocky Point, N.Y.

The Voicepac-2000 rental price includes a Nova minicomputer as part of the system. Ed.

Adapt-A-Dial System And Invasion of Privacy

Do not neglect your editorial policies against invasion of privacy.

I refer to your July 22 article on the Adapt-A-Dial system for guaranteed random phone number sampling.

My objections are based on the fact that it requires conscious effort on an indiviudal's part to secure the privacy afforded by a nonpublished telephone number.

The Adapt-A-Dial system is based on a computerized random generating formula and completely eliminates any advantages the telephone subscriber may have gained through his efforts to secure privacy for himself.

In your story, Adapt, Inc. brags that "the system eliminates sampling errors resulting from omissions in current directory listings."

B. L. Clyde

Huntington, W. Va.

IBM Does Field-Test Many Programs

In the Sept. 16 issue, it was stated that IBM has discontinued field-testing its programs prior to general release.

This is incorrect; IBM continues to field-test many of its programs.

G. L. Morgan, Director
Programming Systems Marketing
IBM

White Plains, N.Y.

If CDP Is Required, Where Will Programmers Go?

I agree completely with Cmdr. Hopper and Herbert Grosch [CW, Aug. 19].

I can think of no reason why a programmer or analyst should be required to have a Bachelor's Degree.

I suppose that the CDP is some form of professional gauge, but I certainly have never used it in my hiring efforts for programmers, analysts, or operations personnel.

Recently, I took issue with Dr. Tanaka and Afips over their stand on a certification program and the enforcement of a professional code of ethics. If we, the data processing community, let these attempts to regulate us succeed, we will face serious problems.

There are no more reasons to certify programmers than there are to certify methods, standards, sales (maybe more here), statisticians; or lower and middle general management types.

If we submit to certification on a mandatory basis, and for example, enforce the educational requirement of the DPMA's CDP, what will we do with the thousands of programmers and analysts thrown out of work? Where will we get the new programmers?

Frank A. Mleko
Director of Computer Services

Signode Corp.
Chicago, Ill.

New Controls for Cobol Overhead Are Coming Fast

Writing a Cobol program appears to be a simple operation. You simply describe the data, write out the procedures, and run a compilation.

You do not need to do anything else – like, for instance, understand the hardware the system is going to run on; or the operating system the object programs will use. These can be left to the experts.

All of which is perfectly true. However, having a Cobol program written so that it runs efficiently on your particular hardware is not so simple.

It may mean that you will have to think about a number of factors; and not just about the question of getting a program that runs.

This is because a decision about any particular point – whether or not that decision is made by your Cobol programmer – may be costing some machine time wastage. Which means dollars – your dollars.

Different Attacks

Recent developments have brought out that Cobol overhead not only is high – but also that it can be attacked from many different standpoints.

In general, each different form of attack indicates different potential weaknesses; although in some cases – such as wastage caused by excessive use of the Perform verb, for instance, more than one attack can be used.

These developments include the provision of compilers which can replace those provided by IBM, an optimizer which can improve the output of an IBM Cobol compiler, the extension of courses dealing with how to write efficient code, and increasing use of precompilers.

To see the relationship between the various possibilities, consider the current workings that lead up to the running of a Cobol program (Figure 1). To start with there is the selection and installation of the hardware itself. Different types of hardware have different characteristics – and can be connected together in different ways.

A set of statements that can be executed in one hour on one system may well take three hours to run on another system which outwardly has the same power.

After the system has been installed, the operating system is selected, and tuned. Here lies the catch.

Operating systems differ as much from each other as hardware installations. Where a set of tapes is wired to a particular controller, or to a particular channel at installation time, it can limit the way that a Cobol programmer can set up his program.

Equally, the way that operating systems are set up to meet what is believed to be the needs of the particular installation produces equally stringent limitations which the Cobol programmer can do nothing about – and which he rarely realizes are in existence.

The process is normally called "system generation" and can affect efficiency in a number of different ways.

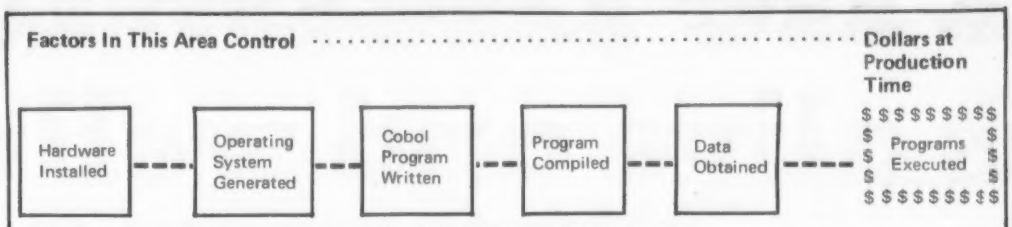

Factors In This Area Control
Dollars at Production Time
Hardware Installed
Operating System Generated
Cobol Program Written
Program Compiled
Data Obtained
$ $ $ $ $ $ $ $ $
$ Programs $
$ Executed $
$ $ $ $ $ $ $ $ $

Figure 1. How The Execution Time of a Cobol Program Originates Now

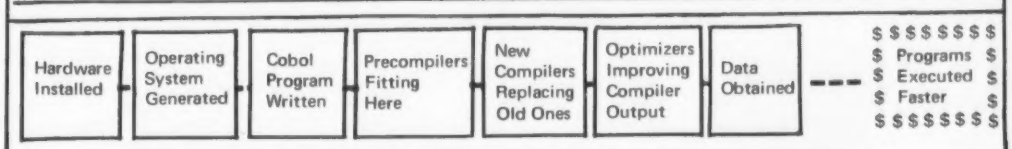

Hardware Installed
Operating System Generated
Cobol Program Written
Precompilers Fitting Here
New Compilers Replacing Old Ones
Optimizers Improving Compiler Output
Data Obtained
$ $ $ $ $ $ $ $ $
$ Programs $
$ Executed $
$ Faster $
$ $ $ $ $ $ $ $ $

Figure 2. These New Possibilities May Help Bring Production Time Down and Save Dollars

Where Will You Control?

The next step in the process is for the programmer to write his program. Nothing complicated here – just the minor little traps of making certain it works, as it is supposed to.

Then comes the compiler. It has certain obvious areas where it can affect efficiency, and is one of the major visible elements. It is used, naturally, to compile the programmer's program. Apparently it only appears in the process of getting a program into operation once – but actually it is also used to help debug the program that the programmer is writing, and so a loop in the process occurs here.

Then comes the data itself – the items that are to be processed. They have to be accepted and processed, naturally – but there is always a chance that some optimization can take place either using the data characteristics, or alternatively changing them in some way so that they do have useable characteristics.

The Run Itself

And finally comes the actual object program run itself. Like the compilation, it is not normally a one-time affair. Instead it is a looped operation, which is repeated time after time.

Because of this, it is the most important area of consideration – by far. But it rarely gets its proper share of the attention.

However, that is not what we are currently concerned with directly. All we want at the moment to see is just where Cobol overhead can be controlled – and to do this we have to see the process of using Cobol in relationship with the full process of writing Cobol programs.

So much for Figure 1. It shows simply the way most things are done now.

Figure 2, however, gives an indication of the future. Here are indicated some of the products which have been released in the last month or so or which will be released in the next month and whose output I have already seen.

One particular point about these items is that each of them in their own way attempts to reduce the overhead involved in running Cobol programs.

Even more to the point is that they all attack the problem at different points!

The first appearance of a possible automatic improvement occurs just after the program is written. One system, as well as doing normal precompiler work such as expanding contractions used by the programmer, checks the statement and pulls out some standard ineffective programming.

It particularly examines groups of tests and substitutes one test where two are being unnecessarily used; and it also notices where there is an unconditional "GO TO" in the middle of a paragraph, and eliminates unused statements. Not much so far, but a start, and an area which I expect to develop during the next 18 months.

The Compiler Itself

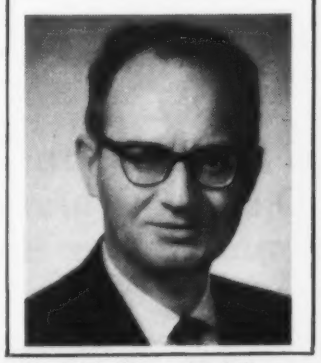
The compiler also is an area of potential improvement. So far there is only one Cobol compiler out which is an alternative for a standard Cobol compiler.

IPS Cobol can replace Cobol D for IBM 360 users.

Again, while there are some object time improvements here, the current emphasis is in a different area – this time in the reduction of compile times. And again, this is an area that will develop very shortly I am convinced.

The Taylor Report

By Alan Taylor, CDP



An intriguing and totally new system has been developed by Capex Corp., Phoenix, for use after the compiler has produced its program.

Called an Optimizer, this system takes in as input the program put out by a compiler and the listing.

In the current case the compiler concerned is Cobol F, the one used by IBM Operating System users.

The Optimizer then examines the created code, improves it, and puts it back together giving user dividends in both time saved and in core utilization.

As far as I know, it is a unique approach, although now that it has been done, I am sure there are going to be imitators.

Each of these key areas, precompilers, the replacement compilers, and the Optimizers, will, I am convinced, play a major role in Cobol programming in the seventies.

One question you should be now asking yourself is "When do I improve my Cobol programming?"

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Letters to the Editor

Chicago Software Firm Operates Under New Name

Your article "Chicago Software Production Feels Recession Cycle" [CW, July 1] states that On-Line Services, a division of Computer Planning Corp. of California, closed its Chicago doors.

What happened was that On-Line Sciences, Inc. merged into Tracor Computing Corp. of Austin, Texas. As a result, I moved from Schiller Park to the Tracor office in Rosemont. Instead of being the branch manager for On-Line Sciences, Inc., I am now the Chicago branch manager for the Software Development Division of Tracor.

The net result to our clients has been "no change" whatsoever. We still have the same technical staff and we are still very much in business selling our control program philosophies and techniques.

Robert C. Sutton, Manager
Software Development Center

Tracor Computing Corp.
Rosemont, Ill.

Brain and Computer Systems Each Essentially Binary

I seriously question that the "brain system" [CW, Sept. 2] is any more generalized than the "computer system" since each is essentially a binary system. The "computer system's" continuing development, but not its usefulness, is probably hindered by the abstract character of its binary values, zero (0); one (1), an inheritance of questionable benefit obtained from the mathematic science.

The "brain system's" continuing evolution, increasing sophistication, and short-term success at survival would seem to be due, at least in part, to its very much less abstract values, attract/repel, which are extremely useful in the physical environment in which the "brain system" exists.

The "computer system's" abstact binary values seem to provide an adaptive potential which is not as apparent, basing this assumption on observed behavior, for the "brain system."

A "computer system" operating within the same binary value constraints as a "brain system" would then become an "artificial brain system." The practical value of such a system can be challenged on the grounds that the "artificial brain system" would not function in a manner superior to any other "brain system."

Constructing "computer systems" which would operate with real binary values other than those of the "brain system" would be useful. Potentially, this would enable the analysis of true alternative means to an end.

I would suggest that the Assembly Language D.L. Szekely is looking for is not universal. Many languages will be required and each will be unique and greatly dependent upon the basic binary values chosen.

Enough is known of 0/1 binary and its language, or at least sufficient is known to facilitate broad application and utilization.

More needs to be known of attract/repel, war, peace, exist/co-exist binary, and the language appropriate to each.

The large number of languages necessary presents a problem; however, individually they appear to be only one-order of magnitude more complex than 0/1 binary since each of the oppositions have scale rather than just 1.

P.W. Magee

Owens-Illinois
Toledo, Ohio

Users Group Says It Was Slighted

[An article] in the Sept. 16 issue [talks about] "the eighth and largest meeting of the only computer software users group . . . ."

We take issue with this statement, since the ASI-ST Users Group has been in existence since April. This group meets semiannually, with the next meeting to be held this winter in Hartford, Conn.

Donald H. Sundeen
President

Applications Software Inc.
Torrence, Calif.

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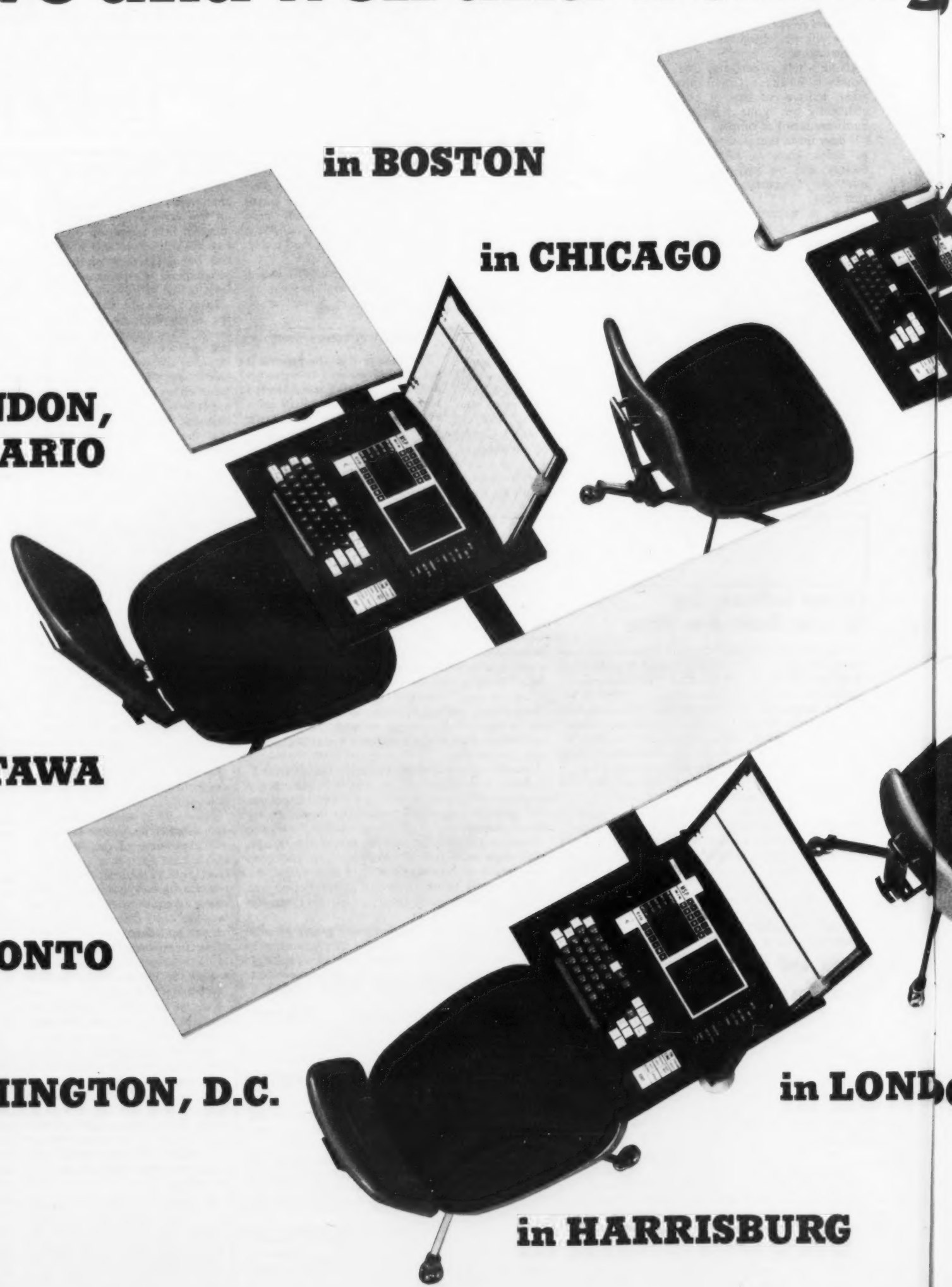
is alive and well and working



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Kindly Fill in the Blanks!

By Edward J. Bride
CW Staff Writer

NEWTON CENTRE, Mass. – People with unusual names, like Blank, for example, probably have many memories, fond or otherwise, of jokes or strange occurrences from their childhood, or adulthood.

The speed and efficiency of the computer has helped write another such story for Bernard A. Blank, a native of this Boston suburb and a local businessman who has the "vanity" registration tag "BLANK" on his automobile.

It was really a human situation, until the Motor Vehicles Department's computer rejected several "meter maids" parking tickets because the ladies had omitted the license tag number.

An ingenious clerk at Motor Vehicles decided that an entry was better than a blank entry, so he wrote B-L-A-N-K in the blanks . . . er, spaces . . . for the registration numbers on the rejected tickets.

"Aha," the computer is reported to have said. "All these tickets belong to Bernard A. Blank."

So all has been corrected now. The tickets have been dismissed, unpaid thanks to the original omissions, and no blank check was required.

Extended Auto Strike May Affect GM DP Personnel

CW Midwest Bureau

DETROIT – The United Auto Workers (UAW) strike against General Motors could have some unpleasant side effects for the nonstriking data processing personnel if the strike continues for as long as some UAW spokesman are predicting.

While no layoffs are being predicted by GM data processing managers at this time, few of those managers contacted by CW would speculate, or give an opinion, as to what would happen if the strike continues on to the first of next year as some union people are claiming.

Friday, Sept. 18 was the last payday for the striking workers in GM plants in the U.S. and Canada. Payroll programs in GM data centers, while not completely stopped due to administrative and management salaries continuing, are substantially reduced in scope.

Other programs affected are inventory, quality control, manufacturing purchasing, and shipping schedules and controls.

R&D, planning, and marketing programs, according to a Detroit GM data processing spokesman, are still in full swing. "I've got plenty of programs to run in the next few weeks," he said.

"I don't like going through the [picket] lines," another DP worker said. "I've got a feeling that the longer the strike lasts, the harder it's going to get.

"Those UAW men are only getting a small percentage of their salaries. They're not stopping us from crossing now, but who knows how they'll feel later . . . even with the police here."

DP Unemployment 1.2% Nationally, Study Determines

GREENWICH, Conn. – A study by a nationwide placement firm specializing in computer professionals has indicated that 1.2% of the profession is unemployed nationally.

Conducted by EDP, Inc., the study includes three cities above the 3% level:

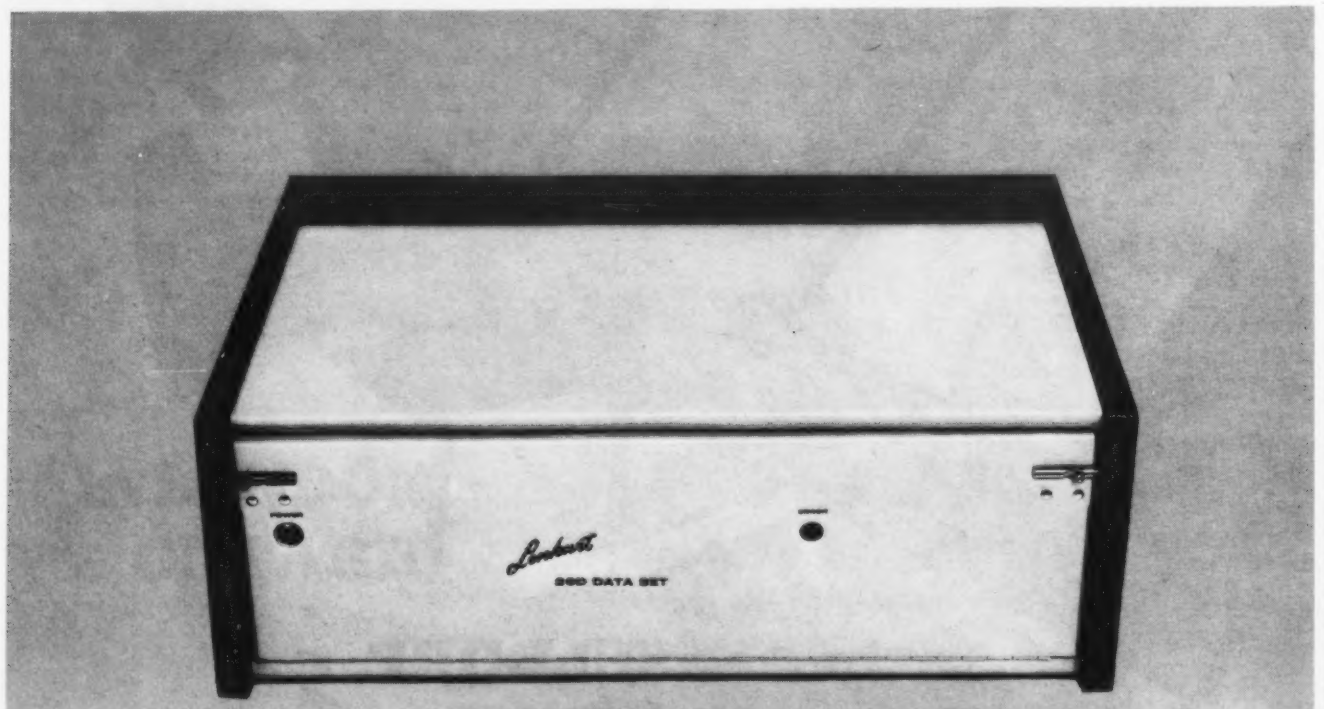
Dallas, 4.2%; Atlanta, 3.3%; Palo Alto, 3.1%; Detroit, 1.4%; San Francisco, 1.4%; and St. Louis, 1.1%.

Also, Chicago, 1%; Los Angeles, 1%; Minneapolis, 1%; Philadelphia, 1%; and New York, .5%.

Of particular interest is the fact that the 1.2% national average is unchanged from the level of a similar study performed in early August. Thus, while overall unemployment among all white collar workers continues to increase, the computer profession appears to have stabilized.

Match-Making Bonus

LONDON – Customers of a Carnaby St. boutique who spend over $24 receive a form entitling them to a free round of computer match-making.



Our 4800 bit modem. The thing that makes it so cheap is the same thing that makes it so good.

4800 bits for $3,325.
The secret is correlative coding (using our modified duobinary technique). It gives you an error rate of 1 x 10^{-6} at a signal-to-noise ratio of 20 dB. It gives you quick-polling (21.5 ms request-to-send / clear-to-send cycle). It gives you automatic error detection (eliminating the need for redundant parity check bits). And it gives you a very low price tag, all at the same time.

Lenkurt invented correlative coding. That's why our 26D is the highest quality, most economical modem available for multipoint polled, C2 line operation.

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Or, for $300 less, you can get the 26D without pre-equalization, for point-to-point applications.

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DOS/CICS Allows Real-Time Multitasks on Small 360s

WHITE PLAINS, N.Y. – The smaller 360 user can employ remote terminals in real-time data base applications with two program products from IBM.

The programs, DOS versions of the Customer Information Control System (CICS) developed for OS/360 more than two years ago, can be used on CPUs as small as a 48K 360/25 or a 64K 360/30. The programs can also be used on the 370, including the new 370/145.

CICS is said to provide an orderly method through which multiple users can converse with a computer through remote terminals, and can handle information from various previously defined data bases.

As examples of applications that can utilize CICS concepts, IBM cited retrieval and updating of inventory, production and maintenance records, and the processing of student data, in addition to accessing of customer information in answer to inquiries.

Used in conjunction with application programs written in either Cobol or BAL, CICS/DOS-Entry utilizes a roll-in, roll-out technqiue to handle multiple tasks. The CICS/DOS-Standard uses more conventional OS methods to handle multitasking within a partition.

CICS is structured around a series of management modules, control tables and optional service programs. The modules are selected and generated by the user. The tables are constructed by the user through the use of CICS-provided macroinstructions, and are used to control the processing environment according to the user's criteria.

The service programs allow some modification of the tables to meet actual conditions at execution time, the company said.

Module Capabilities

The three basic CICS modules are designed to handle: task management, which provides overall control of the job environment; storage management, which provides main storage areas to the other modules; and program management, which handles the fetching of programs from CICS or operating system libraries.

Other modules permit the display of selected areas of storage for debugging, and provide symbolic interfaces between application programs and user data sets.

The reading and writing of the terminals, and the routing of data to given symbolic locations are also controlled by management modules, IBM said.

Control Tables

CICS is tailored to the user's environment by five control tables.

- The program control table identifies the transaction codes and names the first program that each of these transactions requires.
- The processing program table identifies all of the programs that will be used in the CICS environment.
- The terminal control table describes the physical terminal configuration.
- The file control table describes the user's direct access files.
- The destination control table defines symbolically named destinations for use by the transient data management module.

IBM said that users make use of the CICS capabilities through macroinstructions in place of normal Cobol or BAL I/O instructions.

Application programs written using CICS/DOS-Entry will run with CICS/DOS-Standard, and programs written with either can be used with the older CICS/OS, the company said.

Both programs can be used with a mix of terminals if desired, including either typewriter-like or visual display devices, according to IBM.

Scheduled for delivery in September, 1971, CICS/DOS-Entry will cost $180/mo under a license agreement. Three months later, CICS/DOS-Standard will be available for $450/mo, also under license.

Spectra 70/46 Users Pleased With TSOS-6

By Don Leavitt
CW Staff Writer

RCA Spectra 70/46 users are utilizing the virtual memory capabilities of their system although most don't specifically refer to the concept.

Since RCA announced that virtual memory would be the backbone of the new RCA 3 and 7 systems, CW surveyed some current users of the Spectra 70/46 Time Sharing Operating System (TSOS) which will also be the supervisor for the new systems.

Users of the TSOS seem generally agreed that the operating system, particularly TSOS-6 [CW, Sept. 16], is working extremely well. As examples of TSOS capabilities, they cited:

- Re-entrant coding that allowed half-a-dozen programmers to use a Cobol compiler simultaneously.
- Interactive debugging aids that meant that up to 19 terminals were devoted to program preparation, while batch processing continued.
- Paging, or the use of virtual memory, that allowed a user with a program having massive core needs, such as Electronic Circuit Analysis Program (Ecap), to be transparent to other users.

The users surveyed generally agreed that there are still some problems in the TSOS, especially in the Fortran compiler.

But these users expect the problems to be cleared up by RCA in later releases, and particularly before the same TSOS concepts are implemented on the RCA 3 and RCA 7 as the Virtual Memory Operating System (VMOS) [CW, Sept. 23].

The users were generally unhappy with TSOS-4 but were much impressed with the development between TSOS-4 and TSOS-6. RCA also received compliments for the support it has given users in solving problems between the TSOS releases.

RCA's support clearly was needed.

Describing himself as an "enthusiastic virtual memory user," one user nonetheless called TSOS-4 "no good, practically useless." Another user abandoned the 70/46 and had his equipment converted to a 70/45 when he found that sorting was "impossible" and that the Mass Storage Unit's I/O operations weren't handled satisfactorily under TSOS-4.

Diagnostic Centers

The change from bad to good took place, according to one user, after RCA set up a "diagnostic center" to concentrate on TSOS problems. With the center in operation, solutions came quickly, the user said.

Mean time between failures is now much longer under TSOS-6 than under TSOS-4, and is now well within reasonable expectations, according to several users. One user said he goes 12 to 16 hours on the average between failures, compared to only six hours under TSOS-4.

Problems

Some of the outages under TSOS-6 have been caused by the generation of excessive Task Sequence Numbers (TSN), one user said. These numbers accumulate, he explained, and ultimately exceed the limits provided.

To cope with this situation, he concluded, his installation simply takes the equipment "off the air" twice a day, to clear the TSN registers.

Fortran apparently is the biggest problem still facing the TSOS designers. In the words of one user, "Fortran stinks" on TSOS-6.

Others were more definitive in their complaints: one noted that file support is very weak; another said that terminal I/O formats required that programmers "space-fill" when keying in commands, and that they can't control the carriage on the terminals, under Fortran.

An improvement in the Data Management System now means, according to one user, that the paging drum is too slow, but he indicated that the tradeoff is worthwhile, as far as he is concerned.

Other hardware complaints noted were: the system would not support high-speed terminals; the 564 disk units caused problems; and, in one case, the key unit of the virtual memory, the drum, had to be replaced by RCA. In that case, however, the user said he had absolutely no repeat problems with the replacement drum.

RCA is aware of the problems with the 564 disk units and has developed its own unit, the 590, to be the normal disk device on the 70/46, one user said.

Minicomputers Can Be Used To Produce Flowcharts With Compata's 'Quickflow'

TARZANA, Calif. – Users with minicomputers that support Fortran can have machine-generated flowcharts, with the "Quickflow" package from Compata, Inc.

Described whimsically by the company as a miniprogram with a minipurpose at a miniprice, Quickflow is priced at $200.

Quickflow is coded in ASA Fortran to gain applicability across a range of minicomputers, but the choice of language also means that the program can be implemented on many full-sized processors as well, the company said.

As Fortran makes Quickflow nearly machine-independent, so the program's logic makes it language-independent. It operates on the basis of special "comment" cards in the source deck of the program to be charted, and not on the source coding itself.

A Compata spokesman agreed that, carried to an extreme, Quickflow would generate a flowchart from a series of the comment cards, by themselves, without any source coding. This ability, he said, could be used to develop program logic before any coding was actually undertaken.

Codes on the comment cards generate the standard flowchart symbols for question/decision, process and subroutine steps, as well as allowing the user to insert off-line notes to clarify his logic. Text to be printed within the symbol is taken "as is" from the card that triggered the printing of the symbol, Compata said.

Other codes produce page breaks, page titles and subtitles, and an identifiable ending of the logic flow, to make the documentation easily understood.

Compata said that Quickflow follows the "down-and-to-the-right" charting convention, with the mainline going down the page, and the alternate choice on decision blocks carried out to the right. The company noted that the re-entry point is identified at the end of the alternate arm out of a decision block, and that a line is generated to lead back into the chart at the re-entry point, when it is reached.

The output is never more than 8 in. wide, to fit on the teletypewriter units used with many minicomputers.

Quickflow requires only one pass of the subject source deck the company said, and operates in 8K of core on most minicomputers.

The $200 package is ready for immediate delivery.

Compata Inc. is at 18345 Ventura Blvd.

Package for PDP-11 Allows PDP-8 Simulation, Debugging Capability

MERIDEN, Conn. – Software written for DEC PDP-8 minicomputers can be run on DEC PDP-11 machines, with an emulator package, Emu18, from the Computer Software Division of Canberra Industries.

The system is actually two PDP-11 programs, Canberra said. The basic program allows operators to load and run 4K-word PDP-8 programs in a 4K-word PDP-11/20. The other program utilizes an 8K-word PDP-11/20 to emulate a 4K-word PDP-8, providing up to 50% faster program execution, according to the company.

The company said that the price of the total package is $1,200. Individual programs and options are priced separately.

Canberra Industries is at 45 Gracey Ave.

Hospital Program for System/3 Simplifies Patient, Company Billing

WHITE PLAINS, N.Y. – Small hospitals will be able to simplify patient and insurance company billing with a new program product from IBM for the System/3.

IBM said that the hospital patient billing program is compatible with the System/3 hospital accounts receivable program, which helps hospitals estimate revenue from patients and insurance companies.

The hospital patient billing program is scheduled to be available in the first quarter of 1971, under a license agreement, at a monthly charge of $65.

Two Methods

Package Accesses Variable Length Indexed Records

CHICAGO – Two access methods, Cham and Visam, have been designed to provide 360 disk file users with record storage, manipulation and retrieval facilities not generally available. Cham can be used with either Cobol or Adpac programs. Visam is supported under Cobol only.

According to the developer, the Weiland Computer Group, the Chained Access Method (Cham) provides all the routines necessary to establish, maintain and access a file of chained records.

Weiland explained that chained records are series of records having a common parent, or key, which are connected in a logical sequence though not necessarily in physical sequence on the file.

The second method, Variable Length Indexed Sequential Access Method (Visam), supports variable length, blocked indexed sequential records on both 2311 and 2314 disk drives.

Visam may be used in any application involving sequential record processing, random record processing, or both, the firm said. As an example, Weiland cited a customer file that was accessed on-line during the day, but processed in batch mode during the evening.

Transaction Records

Cham may be used in applications that require accumulation, retrieval, and maintenance of transaction, inventory or trailer-type records. Weiland said that Cham can be used to add an unlimited number of trailer records to a master.

The company said that Cham is particularly useful in relatively low activity applications involving a high degree of transaction review. Examples of this type of application cited by the company include credit control, collateral control, loan accounting and inventory control.

Visam may be used in a Cobol program. Cobol has access to Visam through a set of specially coded linkage routines.

All Cham facilities are available to any Cobol or Adpac calling program, the company said, through a standard linkage interface.

Complete file statistics are maintained and updated on each Visam file access, according to Weiland. These statistics are displayed at the user's request and include such data as current file size, average record length, access timings and percent overflow area in use.

Visam can be purchased for $5,000, Cham, for $2,500. Weiland notes that these are 'per user' prices. The purchaser is free to make as many copies of the programs as he needs, without additional cost.

Weiland Computer Group Inc. is at 330 South Wells, Suite 1004.

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NCI 'Cross-Ref' Lists Systems and Flags Poor Statements

PHOENIX – A system that generates cross-reference lists, resequences source programs and flags inefficient statements, for programs written in Assembly Language or Cobol, is available from National Computing Industries (NCI).

NCI said that Cross-Ref can take a series of programs and produce separate listings and cross-references for each, or it can consider the programs as a single system, merging all entries into one master cross-reference list.

The system normally uses page and line numbers to keep references current. However, if page and line numbers are omitted or out of sequence, Cross-Ref will automatically assign sequence numbers and use those, the company said.

Unlike compiler listings, in which invalid statements are marked, the Cross-Ref program listings are said to flag steps that, while they may be legal, are considered grossly ineffective and in need of attention.

NCI said that situations that would be flagged include nonbinary subscripts and every arithmetic operation on a display field.

The cross-reference lists are sorted alphabetically and, according to the company, show every data element, procedure, literal and external name.

The company said that the system is device independent and can use input from cards, disk or tape, or a mixture of these media.

Cross-Ref can combine a program module punched on cards with one already on a disk library, a spokesman noted. Output can also be on either printer, disk or tape, he added.

Execution time is normally a matter of the speed of the I/O devices. NCI said that the internal speed is rarely longer than a minute.

According to the company, Cross-Ref operates under DOS/360 release 19 or later. It requires 24K of available core, one disk, one input device and one output device.

Cross-Ref sells for $965.

National Computing Industries is at 3003 North Central Ave.

CCI Has Package For H1648 T/S System

ENGLEWOOD, Colo. – The on-line management information and accounting system developed by Computing Corporation Inc. (CCI) for use on the 360 and other full-sized CPUs and minicomputers [CW, Aug. 26] has now been adapted for use on the Honeywell H1648 time-sharing system.

The 30-program package includes accounts payable, accounts receivable, payroll, inventory control, general ledger, balance sheet, and profit and loss statements. System design provides for the internal "explosion" of single data entries into multiple transactions applicable to the separate processing paths.

A completely tailored turnkey version of the H1648 package is available for in-house use for about $60,000, according to CCI.

Computing Corporation Inc. is at 3375 South Bannock.

Keyboard-to-Cassette Recorder Is Lightweight, Rents for $75/mo

DERRY, N.H. – A CRT-equipped keyboard-to-cassette unit weighing only 20 pounds has been developed by Data Input Devices (DID), Inc. to rent for $75/mo.

Called the Term-mite, the unit features portability that allows it to be used in such point-of-entry applications as inventory and order entry. Enhancing the portability is the availability of battery-powered operation.

More conventional applications would use the desk-top unit for source data preparation in banking, brokerage, insurance and utility applications.

Data is displayed on a 100-character screen as it is keyed. Standard record length is limited to 98 characters. A scrolling option allows record lengths up to 392 characters to be recorded.

Data is recorded on a standard Philips-type cassette using certified type. Recording density is 300 bit/in. allowing a capacity of 1,200 98-character records per 300 ft cassette.

From the operator's point of view, the machine can resemble a typewriter, a keypunch, or an adding machine, depending on the keyboard.

The operator programs the unit in much the same manner that she would a keypunch, by entering control characters into the program. Provided are such facilities as field DUP and Skip.

Editing control includes space back and forward, character repeat, skip to next field or end of record. Left zero fill is available as an option.

Data validation is performed through rekeying. When an error is detected the operator is notified by a cursor blink.

An additional unit is available which will allow cassettes to be read into the Term-mite, allowing such operations as file updating.

The terminal is designed to be used with the company's Model 90 Pooler which transfers data records from the cassettes to 1/2 in. computer-compatible tape on 8-1/2 in. reels. The pooler can record in the 7-track mode at 556 bit/in. or at 800 or 1,600 bit/in. in the 9-track mode.

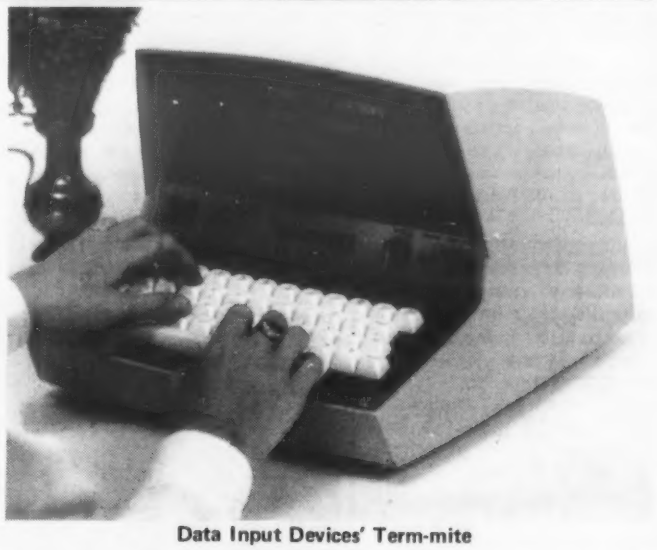
A pollable version that can be used in on-line communications systems is currently being developed, the company said. The Model 90 Pooler rents for $200/mo and can service up to 30 recorders, DID said.

According to the company, the Term-mite will be sold and serviced through offices in major cities. Maintenance problems will be handled through unit replacement, instead of on-site repairs.

The Term-mite is available on a six-month lease at $75/mo for a numeric keyboard. The typewriter keyboard is priced at $79.50/mo, and the keypunch model carries a price tag of $84.50/mo.

All prices are quantities of 1-10 and include service and maintenance. Purchase prices are $2,975, $3,125, and $3,155, respectively, for the three models.

The reader/verifier rents for $50 and sells for $1,500. The left zero fill and key verify options each rent for $5/mo, or sell for $90. Volume discounts are available. The Term-mite is currently available 90 days ARO.



Data Input Devices' Term-mite

Data Input Devices is in the Tinkham Industrial Center, Route 28.

Tektronix Ties Terminal to Mini

BEAVERTON, Ore. – An interface from Tektronix allows the connection of the Tektronix T4002 Graphic computer terminal to the teletypewriter port of dedicated minicomputers.

The Teletype Port Interface also allows the connection of a teletypewriter to the same port.

The interface is independent of external equipment such as phone lines and modems. The computer's existing interface electronics is used, retaining the computer/TTY capabilities, including the paper tape reader and punch.

To switch from the graphics terminal to teletypewriter operation, the user pushes the T4002 front panel Local/On Line button. This disconnects the T4002, connects the TTY to the computer and automatically changes the data rate to 110 bit/sec.

The specific characteristics of each interface are determined by the computer with which it interfaces. All units have a common computer TTY port interfacing jack and a teletypewriter interfacing jack. An optional accessory adapts a modem to the interface.

Data is transferred serially by the interface in full-duplex mode at adjustable rates up to 125K bit/sec. It is compatible with full Ascii code and will assemble information, according to Tektronix, in a graphic compatible format.

With the interface, users of minis are said to be able to use the T4002 in applications where high-display speed and graphics are beneficial. One of the advantages of the T4002 is that programming is made easier and quicker than with slower terminals, the company said.

The Teletype Port Interface is provided with a standard software interface package. Application packages, according to Tektronix, will be negotiated on an individual basis.

Currently, Teletype Port Interfaces are available for the following minicomputers: DEC PDP-8/I and PDP-8/L, Data General Nova and Supernova, and Hewlett-Packard 2114, 2115 and 2116.

The basic price of the interface is $750. Delivery is scheduled for this month.

The address of Tektronix is P.O. Box 500.

Burroughs Unveils Series of Terminals, Intelligent Controllers for Data Collection

DETROIT – A series of $55/mo numeric-only terminals and associated intelligent controllers from Burroughs are designed for computer-connection in data gathering and inquiry-response systems.

The TU 100 Series of terminals and TU900 Series of controllers are meant to complement rather than replace the existing Burroughs TC 500 terminals.

The new units differ from most terminals commonly available, such as the Teletype, in having no alpha capability, being equipped with only a 10-key keyboard, and a printer that has a set of 48 characters using paper strip as an output medium.

Sources of Input

The series does offer a variety of other sources of input, depending on the model of terminal used. These can include punched card, badge, and credit card readers allowing the series to be used in a variety of industrial and commercial applications.

An additional source of output is represented by the optional configuration of the printer that allows the imprinting of single documents.

In constrast with the same company's TC 500 terminals, the TU 500 is not an "intelligent" device. Rather, it depends on its TU 920 controller to perform functions such as data editing and operation sequence checking.

The controller contains a memory buffer that enables it to be used as a data concentrator. Memory buffering is available in a range from 512 to 2,048 characters. Up to 20 terminals can be handled by one controller, Burroughs said. The concentrated data can then be forwarded to the computer at 1,200 or 1,800 bit/sec.

Data Transmission

The terminal uses telephone line, which can be dialed network facilities, leased private lines, or direct connection to a computer, to transmit data at 150 bit/sec.

The new devices are seen by Burroughs as being used in the implementation of low-cost data collection systems by linking remotely located and in-house sites to a central computer. Some of the locations that could use the equipment might include manufacturing plants, warehouses, hospitals, financial and educational institutions and department offices.

The terminal seems to be adaptable to a variety of applications. For example, payroll, inventory, or production data in a factory could be entered through a keyboard, punched card reader and/or badge reader and transmitted to the company's central computer for processing. Collection of patient data with a TU 100 in hospitals is another application that might be suited to the terminal.

Lease Prices

Lease prices for the TU 100 range from $55 to $75/mo. Purchase prices range from $2,400 to $3,000. The TU 920 controller will lease for $125 to $170/mo. Purchase prices range from $5,200 to $7,300.

Deliveries of the systems are expected to begin in April 1971.

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Low Cost Time-Sharing System for PDP-8 Uses Basic

MAYNARD, Mass. – A single-language time-sharing system, specifically designed to cut the cost of computer capability for the user with limited needs, has been made available by DEC.

The system, which uses the Basic Language, can be configured around either DEC's PDP-8/L or PDP-8/I, the company said.

Either configuration can be expanded to handle from one to five users simultaneously. To handle the maximum number of terminals, each configuration includes 8K words of memory. According to the company, the PDP-8/I version is expandable to the 16-user, multi-language, time-sharing system, the TSS-8.

The size of the programs that can be handled by the new system is inversely related to the number of users. A single user is able to write programs up to 200 statements long.

Conversely, five users can write programs up to 40 statements long, according to DEC.

With this type of limitation on program size, the system is expected to be particularly useful to educational institutions where the users are students learning the techniques of programming, rather than using them to solve complex problems.

Price of a single-user PDP-8/L time-sharing Basic system is $14,000 including teletypewriter. Hardware for an additional terminal costs $2,100, and a complete five-user PDP-8/L including the required 8K words of core and five teletypewriters costs $22,400.

A single-user PDP-8/I time-sharing Basic system costs $17,450 including teletypewriters. Hardware for an additional terminal on this configuration costs $2,250. A complete five-user system, again including required core and teletypewriters, costs $27,450.

DEC also recently announced a low-cost, computer-based system for education intended to increase student participation in computer-assisted instruction while reducing the cost.

Based on the PDP-8/L and PDP-8/I computers, the Batch Basic-8 system permits students to code data cards with a pencil and to have their classroom work evaluated by a card reader and computer. The Basic-8 is designed so that when the card-processing operation is terminated, students can immediately have "hands-on" access to the computer.

"The Batch Basic-8 system permits an unlimited number of students to solve and develop mathematical problems, according to the company.

The Batch Basic-8 system is expandable like the Time-sharing Basic System. Cost of a single-user system is $22,050, which includes 4,096 words of core memory, a 32,768-word disk memory, a mark sense card reader, and teletypewriter.

Cost of a single-user PDP-8/I Batch Basic-8 system, which includes 4,096 words of core memory, a 32,768-work disk memory, card reader, and teletypewriter is $24,300.

Program Loader From Tennecomp Used With PDP-8

OAK RIDGE, Tenn. – A device that is designed to end the need for manual program bootstrapping on the DEC PDP-8 series of computers has been introduced by Tennecomp Systems, Inc.

Said to greatly simplify program loading, the TP-1369 allows personnel untrained in computer use to take advantage of the PDP-8.

The TP-1369 consists of a programmable TP-1346 drum that stores the loader program and the TP-1351 tape cartridge drive that contains the main program. Within 25 seconds after depressing the Start button, the device can load a selected program into core, the company said. The tape cartridge is a four-track unit, with each track capable of storing a program.

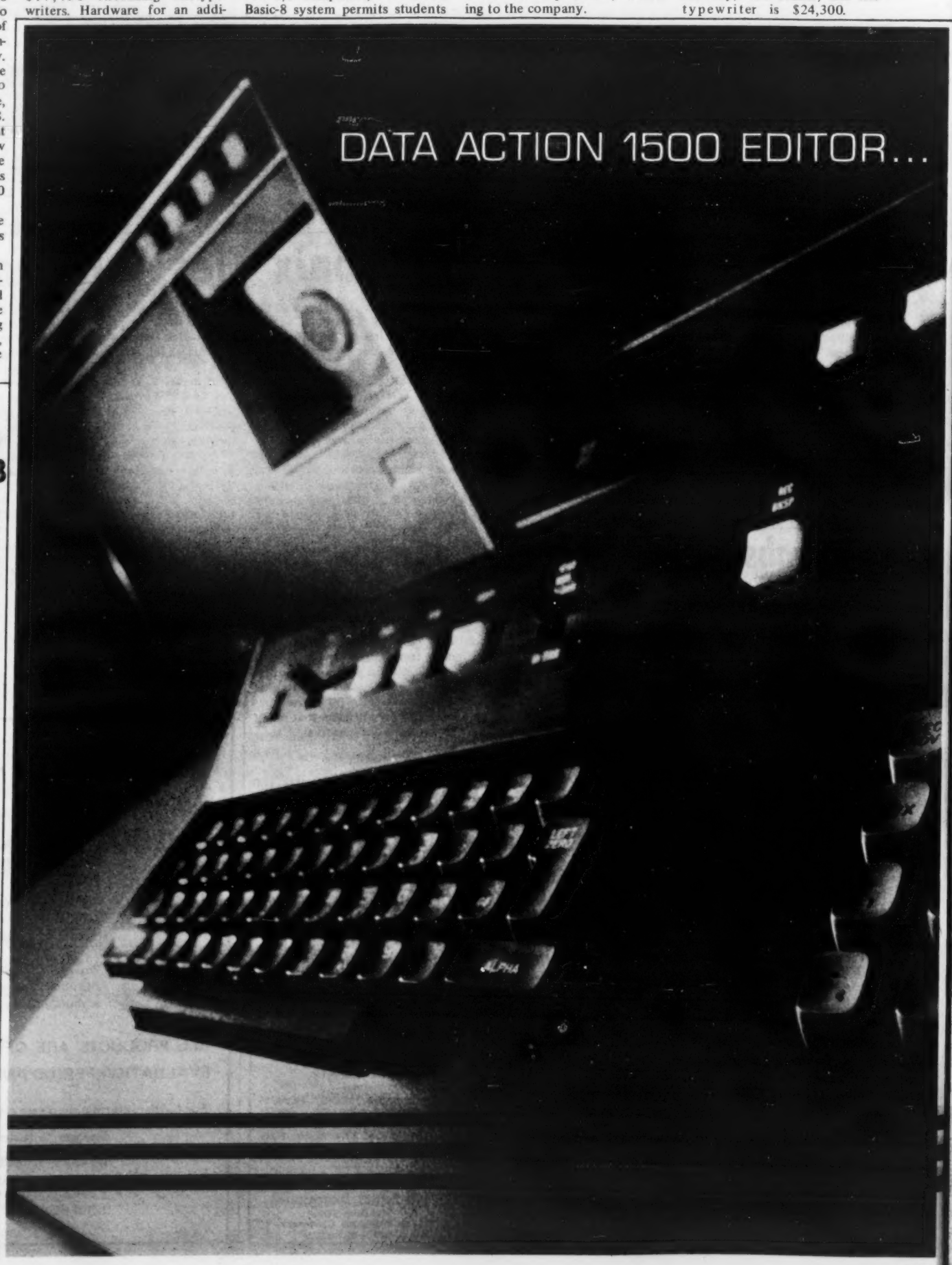
The TP-1351 has a 3.7K bit/sec transfer rate and uses a standard industrial grade cartridge that has a word storage capability of up to 256K.

The price of the TP-1369, including the PDP-8 interface, is $2,750. The unit is currently available on a 30-day delivery schedule.

Tennecomp Systems, Inc. is at 795 Oak Ridge Tpke.

Notice is hereby given that sealed bids will be received in the Office of the Purchasing Agent, The University of Mississippi, University, Mississippi, until 2:30 p.m., October 13, 1970, and opened immediately thereafter for the Lease of Miscellaneous Data Processing Equipment. Specifications are on file in the Office of the Purchasing Agent and may be had on request.

The University of Mississippi
H.E. Haney
Purchasing Agent



Data User Tells FCC AT&T Facilities Are 'Marginal'

By Ronald A. Frank
CW Technical News Editor

BOISE, Idaho – A computer data user here has told the Federal Communications Commission that current data facilities offered by AT&T are "marginal."

Describing itself as "a small but growing user of data communications," the Truss Joist Corp. said it was concerned about the ability of AT&T to provide the data communications facilities that it will be needing in a few years.

In a statement directed to the commission's inquiry into the need for new data communications services, the firm said: "The present [AT&T] price structure and selection of data speeds result in excessively high communications costs"

The firm said long switching times and "noise and distortion on the lines cause excessively high error rates on data." The statement added that the firm expects its own data requirement to increase "ten-fold" in the next decade, and that it doubts the ability of AT&T to handle the increased demand for communications from computer data users.

In discussing the statement, Wayne Eskridge, data processing manager, said the firm regularly transmits data between Boise and seven remote sites using an IBM 1800 which has 2740 terminals equipped with Bell Data sets. Using dial-up Wats lines about eight to 16 hours per day, Eskridge said, the firm transmits both in prime and off-peak periods.

In its statement to the FCC, Truss Joist said it did not feel qualified to judge the capability of MCI or Datran in providing data communications services.

When asked about the possibility of using an alternate non-Bell data service, Eskridge told CW that only MCI among the applicants for new data services had proposed to initiate facilities through Boise.

He said that based on preliminary MCI figures, "it looks like this [type of service] would save us about 10% to 15%."

Eskridge said Truss Joist would not only welcome a less costly data service, but even a service offering better quality of facilities at current data rates charged by AT&T would be welcome.

Communications

Large Users Get GE Concentrator

LYNCHBURG, Va. – A data communications processor with stored program capability from GE's telecommunications product department offers the large user a powerful concentrator at low cost.

The Diginet-1600 concentrator can assemble individual bits, characters, fields and blocks of messages prior to retransmission to their remote terminal destination, freeing computer time, GE said, for other uses.

The 1600 can consolidate, GE said, terminal inputs for transmission over a minimum number of voice-grade lines to the computer. In the opposite direction, Diginet-1600 receives messages from the computer and relays them to the correct output line.

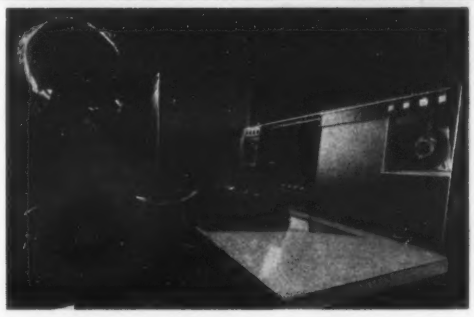
With a magnetic core memory of 4,096 to 32,768 sixteen-bit words, the Diginet-1600 can also store programs used to perform communication processing and control functions. Its buffering capability is said to assure maximum "packing" of the medium speed channel.

Modularity of design allows up to 60 low-speed (up to 300 baud) line terminations including modems, to be mounted in the same rack cabinet with the CPU and memory.

The "computer-end" of Diginet-150 and Diginet-160 series of frequency division multiplex can also be housed in the same cabinet with the Diginet-1600.

Designed to interface with all modes of voice-grade transmission, Diginet-1600 is said to be easily expandable. It can be programmed or configured to include such features as expandable memory, high- and low-speed channels, buffering, software controlled polling and selecting terminals, code and speed conversion.

The Diginet 1600 prices range from $30,000 to $50,000, depending on configuration. First customer shipments are scheduled for December 1970.



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Alan Mardon

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Computer Facilitates Students' Choice of Colleges

By Anne Nolan
CW Staff Writer

EVANSTON, Ill. – There are various ways for a student to search for the college of his choice – counselors, catalogs, and visits to college admissions directors – but many are finding the fastest method to be with the aid of a computer.

Several student/college computer matching companies exist in the country today. Claiming to be the oldest is the College Admissions Center of the Association of College Admissions Counselors (Acac), which has been in business since 1958.

The matching is done by 360/30 using the facilities of the Chicago Tabulating Service which has been working with Acac since the company started in business.

Acac, an organization of about 2,200 colleges, universities, and secondary schools, established the nonprofit College Admissions Center to act as a link between prospective students and member colleges and universities.

Originally intended to aid those students having difficulty getting into college, the program has expanded to include transfer students and juniors in high school.

Provides Information

The purpose of the center is not to counsel the student in his college choice but to act as a disseminator of information. It does not interview, test, or advise students.

Education

About 5,000 students apply to the center each year. Approximately 60% have been aided in their college choice by the center.

A student fills out an information form which includes personal data, interests, scholastic record, and a recommendation by his high school counselor.

The center matches this data with college specifications, and sends a monthly list of candidates to the member colleges, which number over 300, consisting of a brief resume of pertinent admission information. The colleges and universities respond to those students whose resumes indicate that they might be successful students at the school.

No Guarantee

The center does not guarantee admission to any college since that decision is strictly up to the college. The cost to the student for the service is $20.

Teaching Aid Allows Pupils To Provide Individual Answers

By M.W. Martin
Special to Computerworld

MUNICH, Germany – One of West Germany's largest electronic manufacturers, Siemens, has developed a method of programmed education that is said to be the first to allow the pupil to freely formulate his answers to the control questions.

In questions dealing with the nature of an electric current, for example, the answer "movement of free electrons" will be recognized as correct by the computer, however it is expressed.

In earlier experiments, it was only possible to make the pupil select the correct answer out of the several that were listed. The pupil now feeds the freely expressed answer into the computer with the aid of a typewriter keyboard.

With this system of computer-controlled teaching and evaluation, computer assessments give the teacher an objective judgment on the level of knowledge of all pupils. If students have difficulties they can quickly be helped with individual instruction. As each pupil works uninterrupted on his own, the new material is absorbed quickly and intensively.

The computer can also provide lists of pupils' performances, remarks on special circumstances to be taken into consideration when awarding marks, the calculation of overall grades, the writing of reports or admonitory letters, and the compilation of timetables.

3-Day Course Treats DP Security Aspects

SAN FRANCISCO – Physical security in computer installations will be discussed by Louis Scoma, president of Data Processing Security, Inc., Hinsdale, Ill., during a three-day intensive course, "Privacy: Legal and Technological Protection in the Computer Age," to be presented here Oct. 12-14. The seminar is sponsored by Continuing Education in Engineering and the College of Engineering, University of California, Berkeley.

Legal Aspects

The first day's sessions will cover legal aspects and will be intended for lawyers, administrators, public officials and others in related business and government fields, as well as for systems analysts, programmers, data processing managers and those with similar technical backgrounds.

Discussions are scheduled on the issues of civil liberties and political questions, citizen security in a local government information system, and protection of privacy in university data systems. Current California legislation and a history of an Aclu test case involving the California welfare computer system will be included.

The final two days will consist of technical sessions on hardware and software techniques, cryptographic techniques, advantages and disadvantages of today's privacy products, physical installation security, tradeoff considerations in security system design and common pitfalls to be avoided in system security.

A problem-solving session will give participants practical experience in devising and analyzing safeguards.

A detailed course description and registration form may by obtained from Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkely, Calif. 94720.

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Arma to Study Latest Techniques In Record-Keeping at Conference

CHICAGO – Current developments in the latest techniques of record-keeping in business and industry will be discussed at the 15th Annual Conference of the American Records Management Association (Arma) Oct. 12-14 at the Century Plaza Hotel in Los Angeles.

Many innovations in records management will be discussed at seminars, and the newest informational systems equipment will be on exhibit during the meeting of the 1,700-member national organization.

Keynote speaker at the opening session will be Ivy Baker Priest, California's state treasurer and former U.S. Treasurer. Mrs. Priest will speak on "The '70s – Decade of Achievement."

Key speaker at the general session Oct. 14 will be Kenneth K. Kett of the Southern California Gas Co., who will address the group on "Creative Problem Solving."

Topics at Monday seminars will include establishing a records management program; vital records protection planning; micromation: a study of COM (computer-output-microfilm); and information management – reports control.

Seminars on Tuesday will cover micro-

Societies

film for records management, preserving information in machine readable forms, source data conversion and automation; and information management – files control.

Nonmembers may attend the conference.

More information may be obtained from Joseph Ashwell, conference chairman, at Arma National Conference, Worldway Postal Center, P.O. Box 90550, Los Angeles, Calif. 90009.

11th American Meeting of Tims to Stress Theme of Real-Time Management in 1970s

LOS ANGELES – "Real-Time Management – The Task of the '70s" will be the theme of the 11th American Meeting of The Institute of Management Sciences (Tims) to be held Oct. 19-21 at the Los Angeles Hilton.

Innovative papers which present a pragmatic, cost-effective view of developing management tools will be presented by authorities from the fields of industry, education, medicine, aerospace and military, state and local government, transportation, and financial institutions.

Featured speakers will be Robert B. Parsons, vice-president of Computer Sciences for Eastern Airlines, who will give the Tuesday evening banquet address, "Hints for the Real-Time Manager."

The Hon. Carl W. Clewlow, Deputy Assistant Secretary of Defense, will open the meeting in a plenary session discussing "Management Uses of Computers in Government."

The meeting is expected to attract more than 600 attendees including management scientists, computer specialists, and members of top management.

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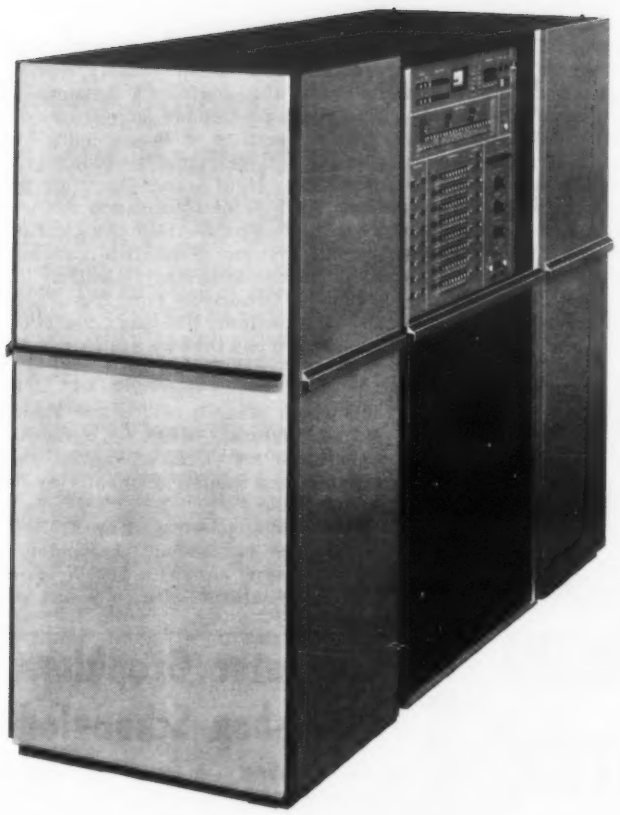

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Criteria for Goode Award Outlined

MONTVALE, N.J. – The seventh annual presentation of the Harry Goode Memorial Award will be made at this year's FJCC.

The award, sponsored by The American Federation of Information Processing Societies (Afips), is presented to honor and encourage outstanding contributions in the field of computers and information processing.

According to Brian Pollard, chairman of the Harry Goode Memorial Award Committee, "Eligibility is restricted to outstanding living contributors whose work fulfills one or more of the following criteria:

- A single outstanding contribution of theory, design, or technique.
- The accumulation of recognized contributions over an extended time period, the total of which represents an outstanding contribution.
- Outstanding contributions in education through academic activities or associated writings.
- Publication or editing of outstanding papers or books on theory or practice which has had an important influence."

Award recipients to date include Howard Hathaway Aiken, George Robert Stibitz and Konrad Zuse (Joint Award), J. Presper Eckert and John William Mauchly (Joint Award), Samuel Nathan Alexander, Maurice Vincent Wilkes, and Alston Scott Householder.

The award honors the memory and contributions of Harry H. Goode, who was chairman of the National Joint Computer Committee – the predecessor organization to Afips.

One of the first scientists to fully comprehend the power and capabilities of computers, Goode formulated many principles of system engineering and developed techniques for design, analysis and evaluation of large-scale systems.

Technical Program Announced

HOUSTON – The technical program for the 1970 Fall Joint Computer Conference will include 26 sessions analyzing the latest developments and expected trends in computer hardware, software and applications.

A total of 74 technical papers will be highlighted by speakers at the conference and nine panel discussions are planned.

The conference, sponsored by the American Federation of Information Processing Societies (Afips), will be held Nov. 17-19 in the Astrohall here. In addition to the program sessions, the conference will feature one of the largest exhibits of computer hardware, software and services ever assembled.

According to Dr. Larry E. Axsom, technical program chairman, "This fall's program will provide a forum for the discussion of concepts, techniques, technologies and implications of the maturing computing field. To provide broad coverage in these areas, we will have 10 sessions on software, five on computer hardware, five covering interdisciplinary areas, and three each on general applications and analog/hybrid computing."

FJCC News

The technical program of the FJCC will open at 12:30 p.m. on Tuesday, Nov. 17, following the conference keynote address. The 10 sessions on software will cover A Spectrum of Programming Languages; Operating Systems and Schedulers; Multi-Access Operating Systems; Analysis of Information Retrieval Systems, Computer-Aided Design, Time-Sharing Systems; Simulation Languages and Systems; Long-Range Goals of Programming Languages; Time-Shared Text and Information Handling, and Communications and On-Line Systems.

Hardware Sessions

Hardware sessions will cover Modern Memory Systems, Design for Reliability, Computers and Communications (two sessions), and Selected Computer System Architectures.

Three additional areas of general applications will be covered – computers in manufacturing, automata and switching, and computational efficiency and performance.

Computer Graphics Workshop Scheduled

NEW YORK – A computer graphics workshop will be held in Houston the day before the opening of the FJCC. Nov. 16.

The workshop will be held at the Marriott Motor Hotel from 8 a.m. to 5 p.m.

A general session will be conducted from 8 a.m. to 10 a.m. on the development and present state of the art of computer graphics and will be conducted by Carl Machover, vice-president of Information Displays, Inc., former president of the Society for Information Display and an internationally known authority on computer graphics.

Subgroups

The group will be divided into subgroups according to experience level.

The full registration fee includes the cost of luncheon, coffee breaks and materials, and is payable in advance – non-ACM members $45, ACM members $40, Siggraph members $35.

All registrations at the workshop are $50. More information is available from Siggraph, Box 933, Blair Station, Silver Spring, Md. 20910.

Special Preparation Program Available To Assist Speakers

HOUSTON – The emphasis will be on top-notch presentations by speakers at this year's FJCC.

According to Larry E. Axsom, technical program chairman, "We strongly believe that each session at the FJCC should be as stimulating and informative as possible.

"In line with this, we are pursuing a special participant preparation program designed to assist each speaker in preparing an effective audio-visual presentation.

The program, available to all speakers, includes a special two-day seminar for participants which will provide professional instruction supplemented by the use of video-tape recording and playback techniques.

In addition, video-tape and slide review equipment will be available to speakers during the conference."

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Conference '70 Expects 700 Attendees

NEW YORK – Over 700 DP professionals are expected to attend Conference '70, the 1970 Data Processing Conference, to be held Nov. 19-20 at the Statler Hilton Hotel here.

F.G. Rodgers, president of IBM's data processing division, will deliver the keynote address on "The Challenge of Change."

The Empire Division of the Data Processing Management Association will present the Conference, which will discuss the management, development and installation of systems from inception to operation. The conference will focus on current problems facing DP management, systems, programming and operation.

Conference Chairman John J. Wilk announced that Dick Brandon of Brandon Applied Systems, Dr. Grace Murray Hopper and Dr. Charles DeCarlo, president of Sarah Lawrence College, will be the luncheon speakers.

Conference '70 will also feature concurrent sessions with eight half-day sessions.

Registration is $55 for DPMA members and $65 for non-members. More information may be obtained from the Registrar, Conference '70, P.O. Box 1926 Grand Central Station, New York, N.Y. 10017.

Societies

3d Smis Meeting Names Officers, Council Members

WASHINGTON, D.C. – In the wake of what outgoing President Robert V. Head termed "a very successful convention," the Society for Management Information Systems (Smis) named new officers and executive council members as the organization enters its third year as a management association.

Some 300 individuals participated in the two-day second annual meeting here.

M.H. Schwartz, assistant controller at the Atomic Energy Commission, was named president; James G. Rude of Standard Computers, vice-president; Richard E. Dooley of the First National Bank of Chicago, treasurer; and Gerald Hoffman of Standard Oil of Indiana, secretary.

New council members are Frederick G. Withington of Arthur D. Little, Norman Ream of S.D. Leidesdorf, John Phillips of Insurance Co. of North America, Donald Malcolm of Computer Applications Inc. and Dr. Daniel Cougar of the University of Colorado.

What Kind of Terminal Do Railroads Want?

WASHINGTON, D.C. – Railroads want a new, tougher terminal device to communicate data from yards to computers and other terminals. So the Association of American Railroads' Management Systems Department has put together a verbal picture of desirable features.

Terminals for the input and output of all kinds of data – waybill information, train consists, payroll reports and the like – are now being used by railroads in some 2,000 locations.

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Also a comparison of major data management systems will be presented and discussed. And you'll be provided with useful FORTRAN program listings as tools in applying file design techniques.

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October 7, 1970

IBM Practices Cited

CPMA Members Won't Negotiate Discounts With GSA

By Michael H. Blake, Jr.
CW Washington Bureau

WASHINGTON, D.C. – In a response to alleged discrimination by the General Services Administration, the Computer Peripherals Manufacturers Association (CPMA) has called on all peripherals makers not to negotiate any discounts with the federal government until it requires IBM and all the other major mainframe manufacturers to provide identical discounts.

In a related move, the association has charged that IBM is adopting design features in its new systems aimed at eliminating the small peripherals manufacturers from a competitive position.

Richard Caveney, president of CPMA, told CW that the 37 members of the organization have agreed to this proposal and will not negotiate discounts with GSA until these terms are met.

Last week, the association revealed that at least two of its members – Memorex and Digitronics – had received letters from GSA which in effect warned that it would be difficult if not impossible for them to receive contracts unless they offered discounts.

GSA would not reveal the contents of the letters, but agency officials admitted that they were worded "very strenuously." George Dodson, assistant director of data services for GSA, commenting on the discount-in-advance-agreement policy urged on smaller peripherals makers, said: "It is not the policy of this agency at this time to deny it (award of a contract) solely for this reason (refusal to negotiate discounts)."

Although he agreed that IBM doesn't offer price discounts, Dodson stated: "In negotiating annual contracts with IBM, we received value consideration." He cited, among other things, the fact that IBM gives the government two years' rental credit towards purchase of a computer, but gives commercial customers only one year's credit.

Caveney also told CW that CPMA is going to protest the World Wide Military Command and Control (Wimmix) procurement – which hasn't been issued yet – to the comptroller general (head of the General Accounting Office), and all the way to Congress, if necessary.

He said the progress of the program has been leading steadily toward an award to IBM, citing the facts that IBM was given the interim study program, and the establishment of the 360 as a second standard.

He added that the program hasn't been broken down to include bids by independent peripherals manufacturers as it was supposed to be. The RFPs for the estimated $50 million Wimmix procurement are expected to be released in about a week.

In the second action, CPMA said: "It is difficult to gain information concerning the various interfaces within the computer system unless IBM chooses to publish such information; it has long been recognized that IBM can, by the design of the central processors and the related channels, controllers and peripheral equipment, severely limit competition by refusing to publish the information.

"This association believes that IBM has embarked on this path for the purpose of further increasing their hold on the market and to the obvious detriment of peripheral equipment manufacturers and, therefore, to computer users.

An Illustration

"The removable disk product line is one illustration of this change in philosophy on the part of IBM. This equipment represents a very significant sales volume to IBM.

"With the announcement of the earlier disk storage equipment, namely the IBM 1311 and IBM 2311, IBM made available to potential equipment manufacturers specifications defining the requirements for interfacing with IBM central processors and controllers.

"However, when IBM announced the later Model 2314 disk storage unit, only the channel to controller interface was published. Thus, it was necessary that any peripheral manufacturer interested in offering a disk drive in competition with IBM must also develop a controller for use with the drives since he could not design for operation with the IBM controller.

"If IBM is, in fact, adopting the design strategy of bundling peripherals with controllers with channels, it is conceivable that future advances in technology will allow the complete integration of the peripherals into the computer. This would virtually prevent any peripheral manufacturer desiring to compete with IBM from offering any peripheral device as an alternate to the IBM equipment."

To remedy the situation, the association urged both IBM and the federal government to adopt a policy calling for the clear definition of both the electrical and mechanical interfaces

IBM Uses Electrophoretic Deposition to Save Parts

POUGHKEEPSIE, N.Y. – IBM has adapted a century-old process known as electrophoretic deposition to protect computer parts from corrosion.

The process is familiar to most beginning biology students as a method to separate and collect proteins in experimental work. In the IBM experiments, the process is used to coat parts with a latex-like film of constant thickness.

In the electrophoretic deposition process, two metallic conductors (an anode and a cathode; the anode the part to be coated) are immersed in a liquid suspension of undissolved plastic particles.

A voltage is applied across the anode and cathode, which causes an electrochemical phenomenon that makes the plastic particles collect and adhere to the anode.

The part to be coated could be a copper line on a printed circuit board or even a complete assembly with the result of a uniform pinhole-free coating, according to the firm.

Electrophoretic deposition is "the most economical, versatile, and uniform coating method we have ever tried," according to Eugene P. Damm Jr., manager of materials technology for IBM.

In addition, Damm said that depending on the application, parts can be uniformly coated with film thicknesses of from 0.1 mils to 50 mils. "We can even build up precision structural parts by precisely controlling coating thicknesses," he said.

Honeywell Sees Earnings Drop For 3d Quarter

MINNEAPOLIS – Honeywell will have lower third quarter earnings than a year ago in spite of continued "strength" in the computer business, Chairman James H. Binger said in a prepared statement last week.

Binger also said that the results of the GE computer business that Honeywell recently acquired will be included in the fourth quarter statement and will have a "positive" effect on earnings for the year.

The poor third quarter results are a result of "softness in the demand for controls for homes and buildings and a lock of buoyancy in industrial markets,

Last year's third quarter showed earnings of $13.7 million (90 cents per share) on sales of $338.4 million.

FJCC Failing to Fill Hall

MONTVALE, N.J. – It's only six weeks until Fall Joint, and the conference is no longer sold out, according to late word received from Afips headquarters here.

The recession has apparently continued to bite into the public relations budgets of many computer companies, to the point that the conference has regressed from a "Sold out, waiting-line-growing" status to an 80%-sold position.

Latest figures available showed 800 booths taken, down from last summer's fully subscribed 1,000 maximum limit. The number of exhibitors was reduced to 275 as of last week, down from 310 plus a growing waiting line.

A spokesman for the American Federation of Information Processing Societies, sponsors of the semi-annual meetings, stated that booths are still available. Spaces were filled last year as late as the opening day of the conference, which this Fall opens on November 17.

The 1970 fall conference is in Houston.

Computers in Canada Post 1-Year-Increase of 663

WATERLOO, Ont., Can. – The total number of installed computers in Canada jumped by 663 to 2,700 between May 1969 and May 1970, according to a census compiled by the Canadian Information Processing Society.

The increase was the largest recorded in any one year period since the society began keeping a census count in 1964, Cips President George Fierheller said. The second largest increase was charted between 1968 and 1969 when 424 computers were added to the census.

The leading manufacturer in terms of both the number of installations and in rental value was IBM with 1,257 installations or 46.6%. In terms of rental value, IBM accounts for 66.9%, a drop from 70.8% recorded last year.

DEC No. 2

Digital Equipment Corp. ranks second in terms of installations with 354 (13.1%), but is only seventh in terms of rental value with 1.9%. Burroughs is third in terms of installations (261 or 9.7%) but falls to fourth in terms of rental value (3.9%).

Honeywell is in the reverse position of Burroughs, being fourth in terms of installations (231 or 8.6%) and third in terms of value (6.9%). Univac is fifth in number of installed machines (220 or 8.1%) but second in terms of value (7%).

In terms of number of installations, the leaders are followed by Control Data, GE, NCR, Hewlett-Packard, XDS, and Collins in that order.

The largest increase in the number of computers in any industry came in manufacturing where the number jumped from 406 to 668. In government circles the number showed a small increase from 259 to 287 and a decline was registered in the construction industry, where the number dropped from 41 to 35.

Distribution industries had 204 computers installed, financial services had 231, service bureaus had 234, and other service industries had 524.

When the society began the census in 1964 there were 502 installed computers.

8 Computicket Stockholders File Suit Against CSC

LOS ANGELES – Computer Sciences Corp. (CSC) has been sued by eight stockholders of Computicket Corp., the ticket reservation system which CSC folded without notice in April.

CSC, holder of 87% of the stock, said the operation was terminated since it would cost $10 million to $12 million to make it profitable and $13 million was already invested in the program.

Two of those filing suit, Walter T. McHale and Kenneth S. Mines, were developers of the programming for the reservation system.

In contest in the suit is the recent award by New York City to CSC for the off-track betting system (see Page 2). The stockholders charge that Computicket held a good chance of getting the award which CSC now has.

They also claim rights to a $1.5 insurance payment for damage to terminals as the result of a warehouse fire. The suit charges that the directors were involved in a conflict of interest when they terminated Computicket since its time-sharing services could provide some of the services offered by Infonet. CSC plans to invest $100 million in Infonet, its new time-sharing network.

In addition to the revenues from the off-track betting system, some European revenues and the insurance settlement, the suit asks for $30 million in actual damages and $30 million in punitive damages.

To Expand Exports

U.S. to Launch 'Go Global' Marketing Plan

CW Washington Bureau

WASHINGTON, D.C. – The Bureau of International Commerce of the U.S. Department of Commerce plans to kick off its "go global" drive Oct. 7 – a marketing program to match specific overseas marketing opportunities with specific American products.

The first major U.S. industry to take part is EDP.

Essentially, "go global" concentrates on expanding the exports of a selected group of industries that hold the highest promise for sustained export increases.

Generally, these product categories represent industries in which the U.S. has technological or other advantages over foreign competition.

EDP was chosen, according to Commerce, because of its phenomenal growth potential. For example, in 1969 $3 billion in data processing equipment was leased or sold in 25 key overseas markets – and growth in these areas is about 20% a year.

The "go global" program is part of intensive U.S. efforts to right the balance of payments between this country and other nations, from a deficit to a plus.

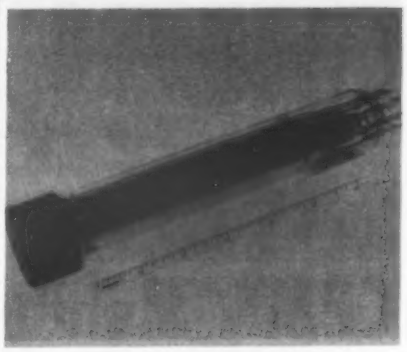
Counseling Service

Under the global marketing plan, Commerce will act as a counseling service to American companies wishing to do business abroad. The department has already done in-depth market research and has targeted the needs and potentials of 25 selected countries regarding EDP. The potentials in these countries cover a five-year period through 1975.

Commerce has available detailed reports on each of the 25 nations selected for the EDP phase of its campaign. These booklets include such information as the quantity and value of local EDP production for the past three years and forecasts through 1975.

Also, a listing of each product with highest "or good" sales potential, together with a statement of the reasons for such an evaluation; an indication of steps U.S. exporters can take to improve their sales position; a profile of the domestic market, with special reference to the business posture of local manufacturers, the distribution system.

And specific market information, including a listing of the top 30 end-users, the major trade associations, top domestic manufacturers, the main U.S. corporations represented in the country for the product categories, and government and industry programs and development plans that could have an impact on U.S. sales; and major trade exhibitions, seminars, congresses and workshops scheduled.



A Clear Picture

This new storage tube, capable of retaining images for more than a week, is available from the electronic tube division of Sylvania Electric Products Inc. The monolithic-silicon-array target of the SP5105 tube provides resolution better than 1,000 lines, and retention times in excess of 12 minutes for gray scale and over one hour for black and white.

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"Computerdaily keeps me ahead of events in the computer industry. It's must reading every day." -- Ralph Johnson, president, Computer Network Corp., Washington, D.C.

"I like something on a daily basis. It keeps names in front of me, and some of the transactions that happen appear in Computerdaily long before the other publications come out." -- John H. Smith, president, Computer Leasing Co., Arlington, Va.

As you can see, Computerdaily is not a typical newsletter. First of all it focuses on the events important to the decision-makers in the computer industry -- and it interprets these events for them every business day. Computerdaily does not rehash press handouts; it sends reporters into the field to dig for the news.

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'Electronic Book' Will Undergo Test For Buy, Sell Orders

NEW YORK – The New York Stock Exchange has announced the start of a live pilot test of the Specialist Electronic Book, a computerized display device to store investors' buy and sell orders that have been left with the specialists for execution.

Looseleaf Notebooks

The Specialist Electronic Book will replace the looseleaf notebooks now used by approximately 360 specialists for maintaining a record of buy and sell orders given them by other brokers for execution. These notebooks list buy and sell orders in 1/8 point increments.

The Electronic Book itself consists of a rectangular console with a special IBM CRT display mounted flush with the top surface of the console. Information in the specialist's book can appear in several types of display formats, but the primary display user will show two columns, with buy orders on the left, and sell orders on the right.

The system also employs a terminal, produced by Data Trends, Inc., with a keyboard for use by the specialist's clerk to enter order and trade information. The terminal has programmed displays which enable the clerk to make entries within seconds.

The display and terminal are linked to an IBM 360/25 on the fourth floor of the exchange from which stored information in the specialist's book is recalled on demand.

Mini Manufacturers Get SMI System To Extend Memory

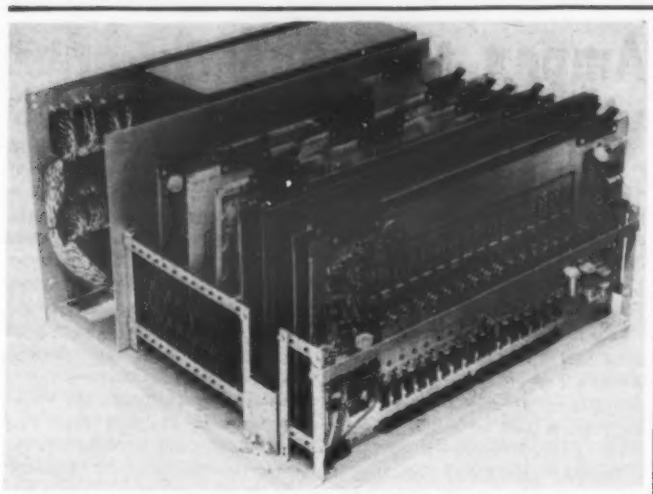
SHERMAN OAKS, Calif. – Standard Memories, Inc. (SMI) has developed a new core memory system specifically designed for use by minicomputer manufacturers as a basic memory extension.

The ECOM F features a 750 nsec full cycle time and a per bit cost that falls below one cent in single unit quantities, according to national sales manager John A. Devine.

The ECOM F has a capacity of 294,912 bits or 16,384 – 18 bit/words; full cycle and split cycle; and an access tim of 325 nsec. It features address and data register, and byte control.

The basic ECOM F with 294,912 bits capacity, sells for $8,447, or only $.0246/bit on a single lot basis.

Standard Memories Inc. is at 15130 Ventura Blvd.



Nemonic Data Systems, Inc.'s NM-1000 Series memory is a medium capacity, high-speed random-access read/write memory family.

Plated Wire Memories Available From Nemonic

DENVER – A family of plated wire memory systems is available from Nemonic Data Systems.

Nemonic Data Systems, Inc.'s NM-1000 Series memory is a medium capacity, high-speed, random-access, read/write memory family. Speeds are read access 200 nsec, read time 300 nsec, and write time 500 nsec.

The storage element is a magnetic thin film plated on .005-in.-diameter wire (Nemonic's NW-100 plated wire). The wire operates in the non-destructive readout (NDRO) mode. Maximum capacity of this family is 163,840 bits.

This series can be configured into systems consisting of 4K to 16K words by 8 to 40 bit/word. A minimum system in this series is 4K by 16 or 8K by 8 while a maximum system is 4K by 40, 8K by 20 or 16K by 10.

Nemonic Series NM-1000 memory family is built with Nemonic's NS-500 Series stack. A full NS-500 stack consists of two planes, with each plane consisting of two mats, and each mat consisting of 256 word lines by 160-bit lines.

A half stack with one plane is used in either the 4K by 16 or the 4K by 20 systems. In an 8K by 16 system, the 1K word lines in a full stack are selected by 16 by 64 diode matrix while the 128-bit lines are multiplexed into 16 sets of digit electronics. Other systems can be configured from the same basic components.

NM-1000 plated wire memory systems are priced from $.037 to $.11/bit depending on quantity and word size.

The firm is at 1301 W. Third Ave.

PEC Unveils Transports, Reduces Price of 7x40

CHATSWORTH, Calif. – Peripheral Equipment Corp. has introduced 72 new configurations of its IBM-compatible read-only tape transports and has slashed the price of its Model 7X40 read-after-write transport.

The new transport configurations are designed for use in computer output microfilm equipment, off-line printing and plotting in phototypesetting, according to Geoff Taylor, PEC director of marketing.

Unit Speeds

The units operate at tape speeds to 45 in./sec, have data densities of 200, 556, or 800 char/in. NRZI or 1,600 char/in. phase-encoded, have a multi-format capability, and have special bad tape data recovery features, he said.

They are priced at $2,900 in quantities of 100 for NRZI or $3,600 in the same quantities for 1,600 char/in. phase-encoded model with single gap heads.

The 72 models have various track configurations, data densities, and data transfer rates. The appropriate models can read in both the forward and reverse directions any 9-track NRZI or phase-encoded tape or any 7-track NRZI tape. In the 7-track NRZI configuration, PEC offers a choice of any two of the three standard data densities.

The transports are designed for 19-in. rack mounting consistent with EIA requirements. Unit height is 24 in. and weight is 85 lb. The all silicon electronics operate over a range of input voltages from 105 to 250 V ac at frequencies from 47 to 400 Hz. Maximum power consumption is 400 W.

Price Cuts

The price cuts on the firm's 7-in. reel Model 7X40 transport amounts to approximately 12.5% – $3,600 to $3,150. The units are available for as low as $2,520 in quantities of 100, according to the firm.

The Model 7X40 is part of PEC's 7000 Series of low cost IBM compatible 7-in. reel transports. The transports require only 8-3/4 in. of rack height, yet contain most of the features of higher priced, more sophisitcated transports. The transport is available in 8-track at 800 char/in. and 7-track with any two densities of 800, 556, or 200 char/in. Standard tape velocity is 12.5 in./sec with a rewind speed of 50 in./sec.

PEC is at 9600 Irondale Ave.

New OEM Products

Documation Introduces M 200 Card Reader

MELBOURNE, Fla. – Documation, Inc. is offering the M 200, a new low-speed, addition to its family of heavy duty card readers.

The M 200 is a compact addition to the M Series. Available at 200 card/min, this reader offers the advantages of L.E.D. light station, phototransistor read station, hysteresis synchronous motor, and a full complement of integrated circuit timing and interface electronics.

It is said to be an ideal card input companion for minicomputers and remote data terminals. The M 200 sells for $1,275 in OEM quantities; delivery is 60 days ARO.

Shaft Encoder And Display System

FARMINGDALE, N.Y. – LEM Instrument Corp. has announced the availability of the Model EDS-170 Shaft Encoder and Display System, a complete position measuring system.

The LEM Model EDS-170 encoder has fewer brushes than is usual, the firm said. The display accepts the BCD output of the encoder, translates and displays the position information in parallel decimal form on gas discharge tubes. All necessary power supplies and circuitry are built in.

Additional features include low torque and inertia, total range of 99,99 revs., compact size, easy mounting and optional BCD outputs. Price for the LEM Model EDS-170 is $995.

LEM Instrument Corp. is at 20 Sarah Dr.

CDC Unit's Motor Bows

MINNEAPOLIS – A new capstan drive motor for 150-200 in./sec tape transports is a size 44 dc Low Inertia motor designed by Control Data Corp.'s Cedar Products.

This latest addition to a family of dc Low Inertia motors designed for use with computer peripherals has an acceleration from stall in excess of 400,000 radian/sec, with a mechanical time constant of 1.0 msec.

According to the manufacturer, this unit (measuring 4.4 in. in diameter) weighs just 12 lb, and has highest possible torque/inertia ratio.

CDC's Cedar Products is at 2300 Berkshire Lane.

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Ampex to Supply Sycor With Digital Tape Drives

CULVER CITY, Calif. – Ampex Corp. has received contracts exceeding $700,000 from Sycor Inc., Ann Arbor, Mich., to supply Model TMX and TMZ low-cost digital tape drives.

Eugene E. Prince, vice-president and general manager of the Ampex computer products division, said the interchangeable tape drives will be used in Sycor 610 communications systems (primarily the TMZ) and Sycor off-line data translators (primarily the TMZ).

Prince said the use of the Ampex units will enable Sycor to offer users a choice of tape speeds and reel capacities with either system. Speeds and capacities range from 12.5 in./sec and 1,200 ft for the TMX to 37.5 in./sec and 2,400 ft for the TMZ. Both units generate data in IBM-compatible format.

Ampex has also begun delivery of core memory stacks to the Friden Division of The Singer Co. under contracts totalling about $650,000.

According to Prince, the stacks will be used in the central processing units of data processing systems developed by Friden's Advanced Systems Division, San Leandro, Calif.

Contracts

Computer Technology, Inc. has received a three-year contract from the Blue Shield Plan of Illinois Medical Service of Chicago to provide computer processing services for Medicare Part B claims processing in the metropolitan Chicago area.

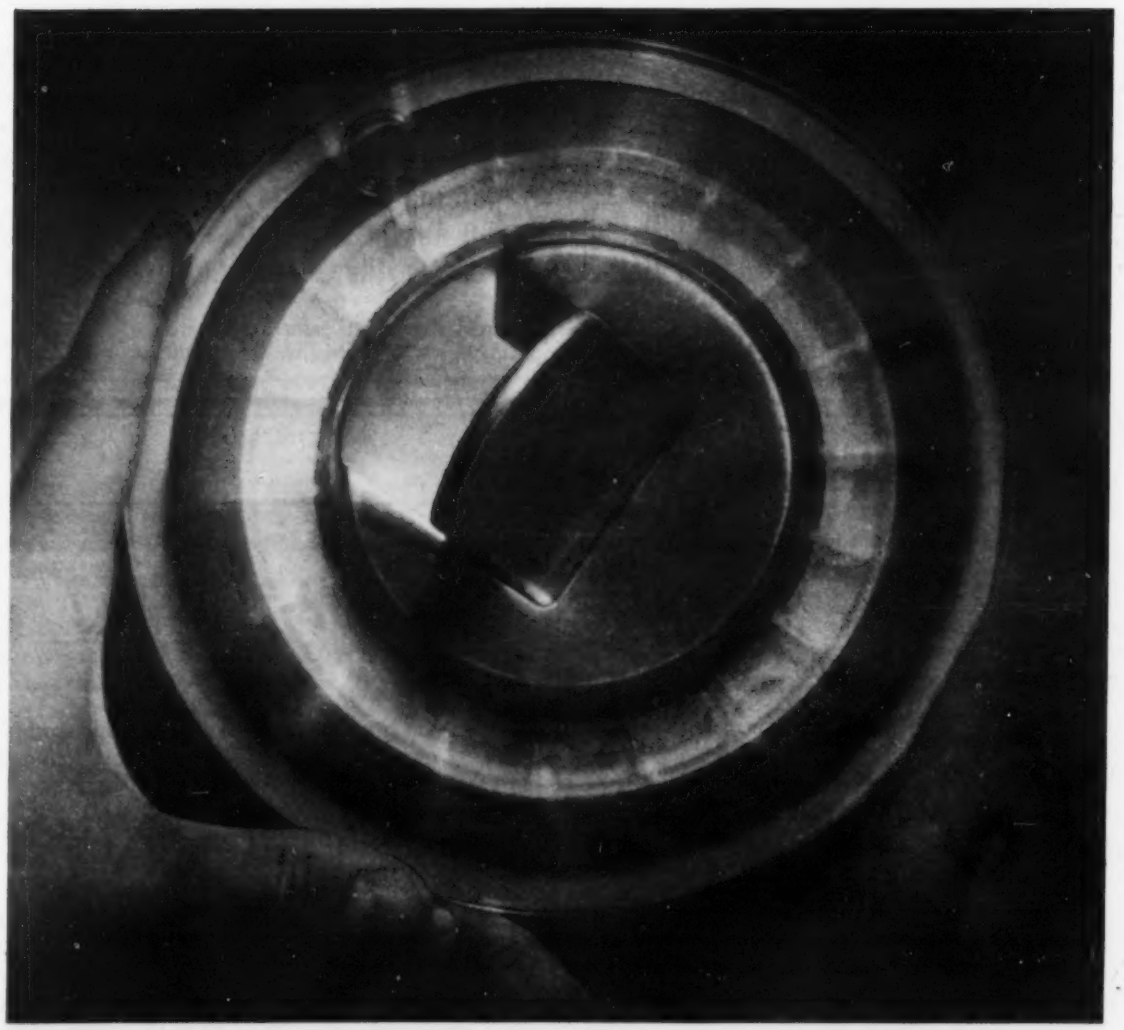
Software Systems, Inc. of Washington, D.C., has been awarded the facility management contract by Associated Distributors, Inc. of Atlanta. The contract, worth about $2 million, is for 75 months and includes systems development, implementation, and operation.

Ampex Corp. has received a contract exceeding $300,000 per year from the Department of Defense to supply Model TM-1624 and TM-1629 digital tape drives for on-line use with IBM 360/65, 7080 and 1401 computers. The company has also received an $880,000 contract to continue supplying modified Model TM-7 digital tape drives to Western Electric Co. for use in two Bell System programs.

Industry Computing Systems, Inc. of Los Angeles has been awarded a contract by British Motor Car Distributors, Ltd. of Compton, Calif. Under terms of the contract, ICS will accept responsibility for the existing data processing installation at BMCD, including the computer and personnel, and will provide complete computer facilities management services.

Informatics, Inc., Canoga Park, Calif., has received a $1,056,798 contract from the U.S. Air Force to design, develop and implement an intelligence data system.

Boole & Babbage



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Business Analysis

System Development Joins the Fight, Finds It Rough

By Michael Merritt
CW Staff Writer

SANTA MONICA, Calif. – In the four years from 1966 to 1969, when it was a non-profit foundation, System Development Corp. made a profit each year, adding up over the period to more than $1.5 million.

Last year, in its first time out as a real, live, trying-to-make-money corporation, SDC lost $553,000.

Founded as a creature of the Air Force to perform programming and systems analysis tasks, SDC formally changed to a privately owned corporation July 1, 1969, much to the consternation of West Coast software houses.

SDC's $55.6 million fiscal 1970 billings and 1,620 professionals make it one of the largest service companies in business.

Its new competitors claimed that it had the unfair advantage of total government protection during its gestation, while the independents had to slug it out in the marketplace.

Judging by its first-year performance, though, a competitive SDC may not be as great a bogeyman in the near future as they had feared.

How Big a Problem?

SDC is still oriented toward government. Its military divisions accounted for $46.6 million of its 1970 revenues, and the public systems and commercial systems divisions brought in only $8.9 million, or 16% of the total.

Even in the non-military areas, SDC's contracts come almost exclusively from governmental bodies.

The public systems division reported 1970 business of $6.5 million, primarily in contracts for the city of Charlotte, N.C., the Los Angeles Police Department, and the Department of Transportation. And SDC has been seeking civil programs for five years.

Contract software comes under the commercial systems division, which reported $2.4 million in sales, a 60% increase over 1969. This division also includes the company's data center operations, which it says has "an assured volume of almost $2 million in sales carrying over into fiscal 1971 and fiscal 1972."

If the same amount holds true for fiscal 1970, that leaves only about $500,000 for contract software and facilities management revenues.

In 1970, total military sales (as opposed to a divisional breakdown) dropped $7.3 million, or 13%, and non-military sales rose $2.1 million, a growth of 30%. While the rate is respectable, the absolute value must be disappointing to SDC.

It also leaves the company depending on military contracts for 84% of its business, and other goverment contracts for 11%; only 5% comes from commercial sales. By comparison, in 1969 88.7% of sales were military, 9.2% civilian, and 2.1% commercial.

Granted, 1970 has not been a bountiful year for software houses, but if an outfit as big and prestigious as SDC can only drum up $500,000 worth of this sort of business, SDC is having trouble changing its spots.

A Look at the Ledger

As to financial health, SDC lost $279,000 from operations this year, and had to write off another $274,000 in extraordinary items.

The write-offs were for a cancelled joint venture in urban planning, which would return "no profit in the foreseeable future," according to an SDC spokesman, and for closing one of two time-sharing facilities and cutting the other back to one four-hour shift a day. The company's annual report attributes the center closings to "considerable softness" in the national time-sharing market.

The small loss, including extraordinary items, worked out to 17 cents a share, while the company showed a profit of four cents a share in 1969.

SDC's year-end report, dated June 28, also reveals another problem. While total current assets weigh in at almost $12 million, all except $87,000 is accounted for by receivables. "substantially from United States Government," of which $6.3 million is billed and $5.6 million unbilled.

In other words, on June 28 SDC had only $87,000 available to pay bills, and at that time accounts and notes payable were $2,490,000 and total current liabilities added up to $7,398,000.

By comparison, one year earlier cash assets were $1.4 million and total liabilities were $6.7 million.

Depending on how fast the government pays its bills, SDC looks very vulnerable to a cash squeeze, a problem familiar to many government-oriented companies. The total debt of the firm on June 28 was only $275,000, though, so borrowing against the government receivables or other SDC assets would probably be easy.

SDC says that it has sufficient credit with banks to cover any sticky situations, the company is obviously not going out of business, but borrowing costs money – 8% to 10%.

Finance

DPF&G Cites Depreciation Charge for Earnings Drop

WHITE PLAINS, N.Y. – Recovering from multimillion dollar year-end losses, Data Processing Financial and General Corp. has reported first quarter earnings of $1.6 million or 40 cents a share, on sales of $12,385,357.

For the same period last year, DPF&G, one of the biggest independent computer lessors in the U.S., reported net income of $2,312,044, or 68 cents a share, on revenues of $12,090,133.

DPF&G reported revenues of $49.4 million and a net loss for fiscal 1970, ended May 31, of $4.3 million, or $1.14 per share, after a $4.8 million income loss from discontinued systems division operations, and an extraordinary charge of $6.6 million. [On Sept. 9 CW indicated that the loss for discontinued operations and the extraordinary charge were in addition to the net loss.]

Speaking at the stockholders meeting, DPF&G's new president, Ryal R. Poppa, said the drop in first quarter earnings was due to "increased depreciation charges, resulting from a change in depreciation policy . . . and a higher deferred income tax rate reflecting reduction of available investment tax credits applicable to the 1970 period."

Poppa noted that the more conservative depreciation policy reduced first quarter revenues by $300,000.

Tape Drive Limit

The executive also said that DPF&G plans "to put substantial resources behind the marketing of [our] new tape drive unit, which is in an advanced test market."

Poppa told the shareholders that with the possible exception of Berkeley Computer Corp., "all operations that penalize the company's operating results" were written off at year's end.

Describing the firm's efforts to protect its $2.4 million investment in Berkeley, Poppa said that DPF&G and the University of California, which has also invested in Berkeley, are trying to find financing to enable Berkeley to "realize its potential in the advanced time-sharing and services business."

Berkeley "has superior hardware, a talented technical staff and a competent development group, but the difficulty of raising working capital in a tight-money economy and the capital needs required to bring Berkeley's systems into the market may force us to reevaluate our investment," Poppa said.

DPF&G detailed the losses from its systems division. The 1970 net operating loss was $2.6 million, write-offs for development costs were $2.2 million, and provision for liquidation of the division and write-off of goodwill added up to $1.4 million. The whole package meant a loss of $6.1 million from the software and services unit.

CAI Files Bankruptcy, Cash Seized

NEW YORK – Long-troubled Computer Applications, Inc., one of the largest independent software houses, has gone into bankruptcy.

Last Thursday CAI filed for reorganization under Chapter 10 of the Federal Bankruptcy Act, following the impounding of virtually all its liquid assets by the Bank of New York.

Volt Information Sciences' president, William Shaw, said that his company had dropped merger talks with CAI "due to the financial reverses suffered by CAI in the last few days."

Trading in CAI common and two CAI convertible debentures was suspended on the American Stock Exchange.

The death blow was apparently dealt by the Bank of New York when it seized $470,000 of CAI's cash, substantially all of the software company's working capital. The cash was collateral for a $2.3 million demand loan, according to a CAI spokesman.

The bank, which would not comment on the reasons of the move, holds the accounts receivables of CAI and had been releasing cash to the company as needed up until it seized the funds.

CAI reported a net loss of $9.8 million on sales of $20.1 million in the first half of this year, ended March 31. Losses for the previous year had amounted to $9.6 million.

In addition, the firm has been closing unprofitable subsidiaries or selling them over the past year.

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Acquisitions

Mustang Applied Sciences Corp. of Dallas has acquired **Del Monte Computing Inc.** of Houston through an exchange of stock. Mustang and **Systematic Design, Inc.**, Garland, Texas, have contracted to merge their professional services, which will enable them to offer more complete computerized systems design and graphics package to the earth sciences and electronics industries.

Donovan Equipment Co., Inc. has acquired **Severn Products Co., Inc.** Grand Rapids, Mich., distributor of systems and components for computer centers, laboratories and office facilities. Severn will become a subsidiary of Donovan, which markets environmental control systems. Operations will be moved to Milwaukee.

Alco Standard Corp., Valley Forge, Pa., has indicated it will acquire **DVA Corp.**, Mt. Laurel, N.J., for an undisclosed number of Alco convertible preferred shares. DVA manufactures precision mechanical timing devices, and provides specialized DP services through a subsidiary.

The president and founder of **Time-Sharing Enterprises, Inc.** has agreed in principle to sell the firm to a group of private investors in Philadelphia. The firm publishes *Time-Sharing Industry Directory, Time Sharing Applications Directory* and *Newsletter and Special Reports.*

Frank W. Cole has purchased the assets of **Frank W. Cole Engineering Co.**, a subsidiary of Chilton Computer Co. The transaction also included purchase by Cole of two computer programs used in petroleum consulting. The Cole firm specializes in computer simulation modeling and oil and gas consulting.

Whitehall Electronics Corp., Dallas, has acquired the outstanding stock of **Geophysical Data Processing Center**, Houston, which will remain an independent seismic DP center. The acquisition will enable a Whitehall subsidiary, Seismic Engineering Co., to provide complete geophysical service, Whitehall said.

Information & Computing Centers Corp., Dallas, has agreed in principle to acquire at least 80% of **CBC Inc.**, Midland, Texas, through an exchange of securities. Details were not disclosed.

University Computing Co., Dallas, has purchased from Information Systems Corp. the facilities of **CompuShare, Inc.**, Rosslyn, Va., a time-sharing firm. The sale did not involve CompuShare's corporate identity or its outstanding bills and debts.

Auerbach, a Philadelphia management consulting, computer systems architect, and publishing organization, has acquired the publishing business of **Brandon/Systems Press, Inc.**, Princeton, N.J. The acquired firm will be operated under the name of Auerbach Publishers Inc., a subsidiary of Auerbach Corp. for Science and Technology.

Syner-Data, Inc., Beverly, Mass., has acquired **Fort Electronic Products, Inc.**, Wilmington, Mass. Syner-Data designs and manufactures computer peripheral and terminal equipment; Fort Electronic Products manufactures data entry peripheral equipment, and will become a division of Syner-Data.

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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE*QUOTES Division of National Information Services, Inc. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, OCTOBER 1, 1970

E X C H		1970 RANGE (1)	CLOSE OCT 1 1970	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3	- 1/4	-7.6
A	APPLIED DATA RES.	4- 24	7 3/4	+1	+14.8
O	APPLIED LOGIC	2- 19	2	- 7/8	-30.4
O	ARIES	1- 8	2 1/4	+ 5/8	+38.4
A	AUTOMATIC DATA PROC	23- 47	39 7/8	+ 3/4	+1.9
O	AUTO SCIENCES	3- 14	6 1/4	+1	+19.0
O	BRANDON APPLIED SYS	1- 9	1 1/4	- 1/4	-16.6
O	COMPUTER AGE INDUS.	1- 3	1 1/8	- 1/8	-10.0
A	COMPUTER APPL	2- 12	3 5/8	+1 1/8	+45.0
O	COMPUTER ENVIRON	3- 14	2 1/2	0	0.0
O	COMPUTER INDUS.	2- 10	6	+1	+20.0
O	COMPUTER NETWORK	3- 14	5 1/2	0	0.0
O	COMPUTER PROPERTY	5- 15	6 3/4	0	0.0
N	COMPUTER SCIENCES	6- 34	13 1/4	-1 3/8	-9.4
O	COMPUTER USAGE	2- 8	4 1/4	- 1/4	-5.5
A	COMPUTING & SOFTWARE	16- 75	30 3/4	-3 5/8	-10.5
O	COMRESS	2- 10	3 1/2	0	0.0
O	COMSHARE	3- 15	3 3/8	- 1/8	-3.5
O	CONSOL. ANAL. CENT.	1- 3	1 3/8	0	0.0
O	DATA AUTOMATION	1- 24	2 3/4	+ 3/8	+15.7
O	DATA PACKAGING	5- 29	7 3/4	+ 1/2	+6.8
O	DATAMATION SERVICE	1- 6	2 1/8	+ 7/8	+70.0
O	DATATAB	5- 9	4 7/8	+ 1/8	+2.6
O	DIGITEK	2- 5	1 5/8	0	0.0
O	EDP RESOURCES	5- 13	6 1/4	+ 1/2	+8.6
A	ELECT COMP PROG	3- 11	5 3/4	+1	+21.0
O	ELECTRONIC DATA SYS.	31-161	63	+1	+1.6
O	INFORMATICS	4- 21	8 3/4	+2	+29.6
A	ITEL	6- 26	14 3/8	+ 1/2	+3.6
O	LEVIN-TOWNSEND SERV.	1- 13	3 3/4	- 1/2	-11.7
A	MANAGEMENT DATA	8- 25	14 1/8	-1 1/4	-8.1
O	NAT COMP ANALYSTS	1- 8	3 1/8	- 1/4	-7.4
O	NAT.COMP. SERV.	3- 12	4 7/8	+ 1/8	+2.6
N	PLANNING RESEARCH	13- 54	25	- 1/8	-0.4
O	PROGRAMMING METHODS	9- 27	15	+1 1/2	+11.1
O	PROGRAMMING & SYS	2- 5	2 1/2	0	0.0
O	PROGRAMMING SCIENCES	2- 33	2 3/4	- 5/8	-18.5
N	SCIENTIFIC RESOURCES	2- 22	5 3/4	+1 3/4	+43.7
O	SOFTWARE SYSTEMS	1- 2	1/2	- 1/8	-20.0
O	TBS COMPUTER CENTERS	5- 27	5 1/2	0	0.0
O	UNITED DATA CENTER	2- 4	3	+ 3/8	+14.2
N	UNIVERSITY COMPUTING	14- 99	33 1/8	+2 1/8	+6.8
A	URS SYSTEMS	5- 21	7 7/8	+ 1/4	+3.2
O	U.S. TIME SHARING	3- 14	6 1/4	+ 3/4	+13.6
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	21- 62	31 1/4	-3 3/4	-10.7
O	ALPHANUMERIC	2- 15	5 1/2	+ 3/8	+7.3
N	AMPEX CORP	13- 48	20 3/4	+1 1/2	+7.7
A	ASTRODATA	4- 34	7 7/8	+ 1/2	+6.7
O	BOLT,BERANEK & NEW	3- 11	7 3/4	+ 1/8	+1.6
N	BUNKER-RAMO	6- 14	10 1/4	+ 1/8	+1.2
A	CALCOMP	11- 33	20 7/8	-2	-8.7
O	COGNITRONICS	3- 13	6 5/8	+2 1/8	+47.2
O	COLORADO INSTRUMENTS	4- 13	9	+ 7/8	+10.7
O	COMPUTER COMMUN.	5- 36	9	+ 1/4	+2.8
A	COMPUTER EQUIPMENT	4- 12	5 7/8	+ 7/8	+17.5
A	COMPUTEST	14- 28	19 1/4	+1 1/4	+6.9
A	DATA PRODUCTS CORP	5- 26	8 3/8	-1 7/8	-18.2
O	DATA TECHNOLOGY	4- 23	4 5/8	- 1/8	-2.6
O	DIGITRONICS	4- 13	5	+ 1/8	+2.5
N	ELECTRONIC M & M	7- 40	13 3/4	+ 1/8	+0.9
O	FABRI-TEK	3- 8	4	- 1/4	-5.8
O	FARRINGTON MFG	2- 17	3 7/8	- 1/8	-3.1
O	INFORMATION DISPLAYS	4- 20	9 1/4	+3	+48.0
A	MARSHALL INDUSTRIES	14- 67	29 1/8	- 3/4	-2.5
A	MILGO ELECTRONICS	15- 42	33 1/2	+ 3/8	+1.1
N	MOHAWK DATA SCI	19- 87	36 5/8	-2 5/8	-6.6
O	OPTICAL SCANNING	11- 52	19 1/2	+1	+5.4
O	PHOTON	4- 17	9 3/4	0	0.0
O	PHOTO-MAGNETIC SYS.	1- 4	1 1/2	0	0.0
A	POTTER INSTRUMENT	15- 42	24 5/8	-1 1/4	-4.8
O	PRECISION INST.	6- 25	12 1/4	+3 1/4	+36.1
O	RECOGNITION EQUIP	13- 83	21	+2 7/8	+15.8
O	REDCOR CORP.	4- 34	7	+ 3/4	+12.0
N	SANDERS ASSOCIATES	7- 29	16	+2 3/4	+20.7
O	SCAN DATA	6- 53	7	+ 1/8	+1.8
O	TALLY CORP.	10- 23	16 1/2	+1 1/2	+10.0
N	TELEX	10- 25	19 1/8	-1 3/8	-6.7
O	VIATRON	2- 51	4 1/2	-2 5/8	-36.8
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 15	14 1/4	0	0.0
O	BALTIMORE BUS FORMS	10- 21	9 1/2	- 1/2	-5.0
A	BARRY WRIGHT	6- 25	10 7/8	- 1/2	-4.3
A	DATA DOCUMENTS	15- 35	20 3/4	+ 3/4	+3.7
N	ENNIS BUS. FORMS	11- 19	12 5/8	+ 7/8	+7.4
O	GRAHAM MAGNETICS	5- 7	7 1/4	+1 1/2	+26.0
O	GRAPHIC CONTROLS	7- 17	10	+2	+25.0
N	MEMOREX	46-166	84 1/2	-15	-15.0
N	3M COMPANTY	71-114	87	-3	-3.3
O	MOORE BUS. FORMS	27- 38	32 3/8	+1 3/8	+4.4
N	NASHUA CORP	21- 43	30	- 5/8	-2.0
O	REYNOLDS & REYNOLD	25- 48	35 3/4	+1 3/4	+5.1
O	STANDARD REGISTER	17- 30	20	+ 1/2	+2.5
N	UARCO	22- 39	27 1/4	- 3/8	-1.3
A	WABASH MAGNETICS	7- 30	12 1/2	+ 3/8	+3.0
O	WALLACE BUS FORMS	25- 41	38 3/4	+2	+5.4
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	78-173	123 1/4	+4 1/8	+3.4
N	COLLINS RADIO	9- 37	18 1/2	+2	+12.1
N	CONTROL DATA CORP	30-122	46	0	0.0
A	DIGITAL EQUIPMENT	50-124	84 1/2	+ 3/4	+0.8
N	ELECTRONIC ASSOC.	3- 11	7 1/8	+ 1/4	+3.6
A	ELECTRONIC ENGINEER.	3- 14	6 5/8	+1	+17.7
N	FOXBORO	18- 39	26 3/4	+2 3/4	+11.4
O	GENERAL AUTOMATION	9- 42	14	+3	+27.2
N	GENERAL ELECTRIC	60- 85	84 1/4	+2 1/4	+2.7
N	HEWLETT-PACKARD CO	19- 45	26 3/8	+ 7/8	+3.4
N	HONEYWELL INC	65-152	88 5/8	-2 1/8	-2.3
N	IBM	223-387	297	+8 1/2	+2.9
N	NCR	30- 86	42 7/8	+3 1/2	+8.8
N	RCA	18- 34	26	- 1/4	-0.9
N	RAYTHEON CO	16- 33	25	+1 3/4	+7.5
O	SCI. CONTROL CORP.	1- 8	1 7/8	- 1/2	-21.0
N	SPERRY RAND	19- 40	26	+1	+4.0
A	SYSTEMS ENG. LABS	10- 49	21 7/8	+2 1/8	+10.7
N	VARIAN ASSOCIATES	9- 29	15 7/8	+ 7/8	+5.8
A	WANG LABS.	18- 51	36 1/4	-1 1/2	-3.9
N	XEROX CORP	66-115	86 1/2	+1 1/4	+1.4
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	14	+1 7/8	+15.4
O	BRESNAHAN COMP.	3- 9	3 1/2	- 1/8	-3.4
O	COMPUTER EXCHANGE	2- 8	5 1/2	+ 1/4	+4.7
O	COMPUTER LEASING	3- 18	3	0	0.0
N	DATA PROC. F & G	6- 32	15 7/8	+1 5/8	+11.4
O	DATRONIC RENTAL	2- 8	3 3/4	+1	+36.3
A	DEARBORN COMPUTER	10- 24	19 7/8	- 1/4	-1.2
O	DIEBOLD COMP. LEAS.	2- 8	4 7/8	0	0.0
A	DPA, INC.	3- 10	5 3/8	- 1/8	-2.2
A	GRANITE MGT	7- 22	13 1/2	+1 3/8	+11.3
A	GREYHOUND COMPUTER	5- 44	9	+ 3/8	+4.3
N	LEASCO DATA PROC.	7- 30	15 3/4	+2	+14.5
O	LECTRO COMP LEAS	2- 9	3 5/8	+ 1/2	+16.0
A	LEVIN-TOWNSEND CMP	3- 19	6 5/8	- 3/8	-5.3
O	LMC DATA, INC.	1- 3	1 5/8	+ 1/4	+18.1
O	MANAGEMENT ASSIST	1- 4	1 3/4	0	0.0
O	NCC INDUSTRIES	3- 8	4 1/2	0	0.0
O	SYSTEMS CAPITAL	1- 8	3 7/8	0	0.0
N	U.S. LEASING	3- 19	14 5/8	- 3/4	-4.8

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
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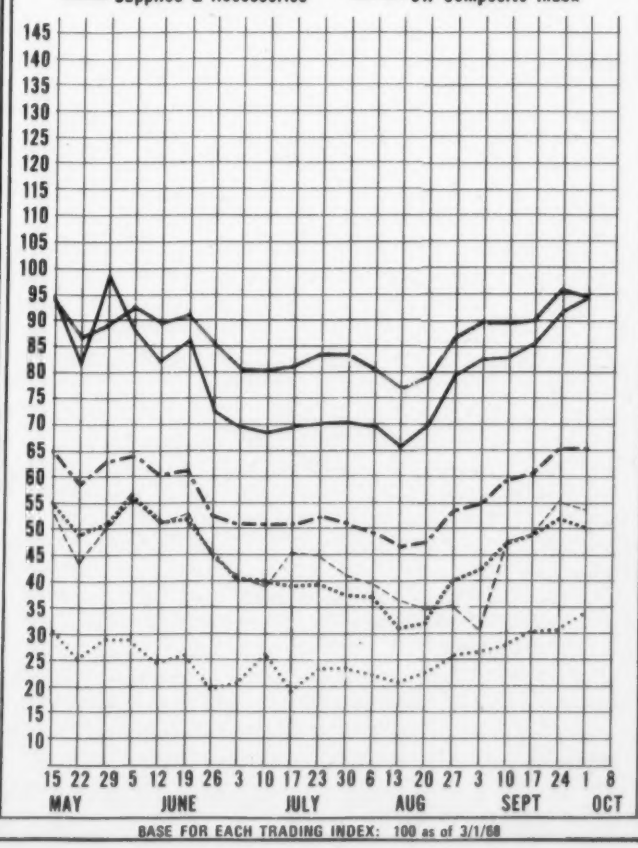
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

FOXBORO CO.
Three months Ended June 30

	1970	1969
Shr Ernd	$.33	$.28
Revenue	34,758,000	30,802,000
Earnings	1,355,000	1,178,000
6 Mo Shr	.47	.36
Revenue	67,713,000	56,809,000
Earnings	1,957,000	1,524,000

CONTROL DATA CORP.
Three Months Ended June 30

	1970	a1969
bShr Ernd	$.17	$.89
Revenue	143,807,000	141,575,000
Spec Chg	d99,000	c784,000
fEarnings	2,738,000	13,912,000
b6 Mo Shr	.26	1.70
Revenue	269,346,000	273,305,000
Spec Chg	d69,000	e5,402,000
fEarnings	4,416,000	30,484,000

a-Restated. b-Based on income before special charge or credit. c-Tax loss carryforward credit. d-Reflects a $207,000 loss on sale of certain manufacturing properties, less tax loss carryforward credits of certain foreign subsidiaries. e-Credit; reflecting a $3.5 million extraordinary credit from Commercial Credit Co. and $1.9 million tax loss carryforward credit of the parent company. f-Equal to 61 cents a share for the quarter and 25 cents a share for the six months period of 1970 compared with 95 cents a share and $2.08 a share respectively, in like periods of 1969.

CALIFORNIA COMPUTER PRODS.
Year Ended June 30

	a1970	1969
Shr Ernd	$.35	b$.43
Revenue	27,540,000	20,474,000
Spec Cred	.....	c167,700
Earnings	799,000	e1,127,850

a-Preliminary. b-Based on income before special credit. c-From sale of securities. e-Equal to 50 cents a share.

LEVIN-TOWNSEND COMPUTER
Three Months Ended June 30

	1970	1969
aShr Ernd	$.21	$.76
bRevenue	15,712,570	16,191,935
Tax Cred	c195,000	.....
dSpec Chg	316,613	144,873
eEarnings	591,897	2,423,767

a-Based on common and common equivalent shares, and on net from continuing operations, before tax credits and special charge. b-From continuing operations. c-From tax loss carryforward. d-From operations discontinued, to be discontinued and held for sale. e-Equal to 18 cents a share in 1970 and 72 cents in 1969.

AUTOMATIC DATA PROCESSING
Year Ended June 30

	1970	b1969
aShr Ernd	$.66	c$.46
Revenue	39,107,029	28,962,702
Earnings	3,365,341	2,274,030

a-Based on average number of shares outstanding, as reported by company. b-Restated to include companies acquired in pooling-of-interests transactions. c-Adjusted to reflect three-for-one stock split effective Nov. 20, 1969.

HEWLETT-PACKARD CO.
Three Months Ended July 31

	1970	1969
Shr Ernd	$.22	a$.24
Revenue	88,075,000	82,727,000
Earnings	5,547,000	6,126,000
9 Mo Shr	.68	a.71
Revenue	262,144,000	234,686,000
Earnings	17,251,000	17,814,000

a-Adjusted to reflect a two-for-one stock split in February 1970.

COMMUNICATIONS SATELLITE
Three Months Ended June 30

	1970	1969
Shr Ernd	$.40	$.20
Revenue	16,793,000	11,546,000
Earnings	3,974,000	1,976,000
6 Mo Shr	.73	.35
Revenue	32,228,000	21,768,000
Earnings	7,319,000	3,501,000

INFORMATION INT'L INC.
Year Ended April 30

	1970	1969
Revenue	$1,100,421	$1,021,425
Loss	613,654	213,393

DEARBORN COMPUTER & MARINE
Three Months Ended July 31

	1970	1969
aShr Ernd	$.62	$.32
bRevenue	9,218,000	6,491,000
Earnings	973,000	552,000
a9 Mo Shr	1.31	1.81
bRevenue	26,237,000	18,693,000
Spec Chg Earnings	c3,621,000	.....
(Loss)	(1,578,000)	2,193,000

a-Based on net income before special charge and on common and common equivalent shares. b-From continuing operations. c-Consists of divesture of pipeline construction business; adjustment of carrying values of Indonesian oil interests, closing of computer education division, and gain on insurance settlement of offshore drilling rig fire damage.

Input **MetaCOBOL**	Output **COBOL**

`PRINT BODY BY 2.`	`WRITE BODY AFTER ADVANCING 2 LINES.`
	`MOVE SPACES TO BODY.`
	`ADD 2 TO LINE-COUNT.`
	`IF LINE-COUNT IS GREATER THAN 56`
	`  PERFORM PAGE-HEADING-ROUTINE`
	`  MOVE ZEROS TO LINE-COUNT.`

`CLEAR WORK-RECORD.`	`MOVE SPACES TO WORK-RECORD.`
	`MOVE ZEROS TO AMOUNT OF WORK-RECORD.`
	`MOVE ZEROS TO HOURS OF WORK-RECORD.`
	`MOVE ZEROS TO RATE OF WORK-RECORD.`

`CANJOB THREE.`	`ENTER LINKAGE.`
	`CALL 'CANJOB' USING THREE.`
	`ENTER COBOL.`
	`STOP RUN.`

`INPUT-FROM CARDS-IN`
`  INTO CARD-IN.`
	`OPEN INPUT CARDS-IN.`
	`PERFORM ZZ-INIT-ZZ.`
	`GO TO ZZ-OPEN-ZZ.`
	`ZZ-READ-ZZ.`
	`IF ZZ-LR-ZZ = 'N' CLOSE CARDS-IN STOP RUN.`
	`READ CARDS-IN AT END MOVE 'N' TO ZZ-LR-ZZ.`
	`GO TO ZZ-BREAK-ON-ZZ.`

`LISEZ LA-CARTE,`
`  A LA FIN ALLEZ A SORTIE.`
`MULTIPLIEZ LES-HEURES PAR LE-TAUX`
`  POUR DONNER LE-SALAIRE.`
`DEPLACEZ PIERRE A COLETTE.`
	`READ LA-CARTE,`
	`  AT END GO TO SORTIE.`
	`MULTIPLY LES-HEURES BY LE-TAUX`
	`  GIVING LE-SALAIRE.`
	`MOVE PIERRE TO COLETTE.`

`01  TRAN-SORT-KEY.  02 SEQ-KEY.`
`03  ACCT.  04 ACCT-KEY.`
`05  ACCT-NO P=X(10).`
	`01  TRAN-SORT-KEY.`
	`02  SEQ-KEY.`
	`03  ACCT.`
	`04  ACCT-KEY.`
	`05  ACCT-NO  PICTURE IS X(10).`

MetaCOBOL™

A macro statement facility designed for peaceful coexistence with COBOL

The limitations of COBOL are well-known to anyone who works extensively with it. Rigid syntax; the frequent need for an excessive number of statements and for repetition of information common to many COBOL statements; and the general inflexibility which too often consumes valuable time for unproductive purposes, are just some of the undesirable characteristics that have been unavoidable till now.

Over the years ADR has been actively associated with the development and expansion of COBOL language and usage. Now, we have developed the logical and long needed improvement. MetaCOBOL: a unique macro statement facility to give you the best of COBOL plus the means to simplify and expand its use for your specific needs.

Here is how MetaCOBOL will function. It accepts standard COBOL and user-defined statements and transforms them into a standardized format compatible with IBM/360 Level E, Level F, and ANS COBOL. It develops and invokes macro statements embedded in COBOL programs. It abbreviates existing COBOL required words and phrases, defines new verbs, simplifies writing multi-part verbs, eliminates the need for writing extensive data name qualifications. MetaCOBOL will also produce program listings in easier to read format, define a library of standard macros and abbreviations and help in debugging. It will produce report writing, information retrieval and other generalized programs from simple parameters. It will generate test data and supply output in source form.
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